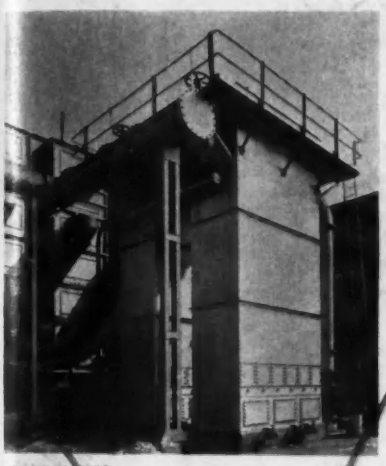
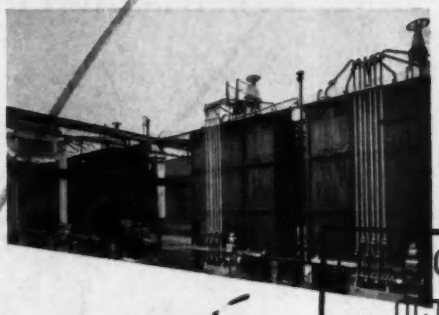
TECHNOLOGY DEPT.

Gas Journal

VOL. 276. 105TH YEAR. LONDON, OCTOBER 14, 1953. NO. 4715. PRICE 1/3



CONDENSERS



WASHERS

The hallmark of high quality plant

C LIBRARY
OCT 27 1953
DETROIT

#4715
vol. 276

PURIFIERS

GASHOLDERS

for high quality gasworks plant

consult

FACTS—NOT GUESSWORK

Our productions are the result of close co-operation between our Research, Development, Design, and Construction Departments.

May we help to solve your problems?

R. & J.

DEMPSTER Ltd.

Constructional Gas & Chemical Engineers

GAS PLANT WORKS · NEWTON HEATH

MANCHESTER · 10

London Office : 34, VICTORIA STREET, S.W.1

We make:— BY-PRODUCT PLANT · CONDENSERS · DETARRERS · GASHOLDERS · GAS VALVES & CONNECTIONS · IRON CASTINGS · PURIFIERS · STILLS · TANKS · WASHERS · WATER GAS PLANT, etc.

GAS COMPRESSORS

150 YEARS OF ENGINEERING EXPERIENCE GOES INTO THE MANUFACTURE OF OUR PRODUCTS

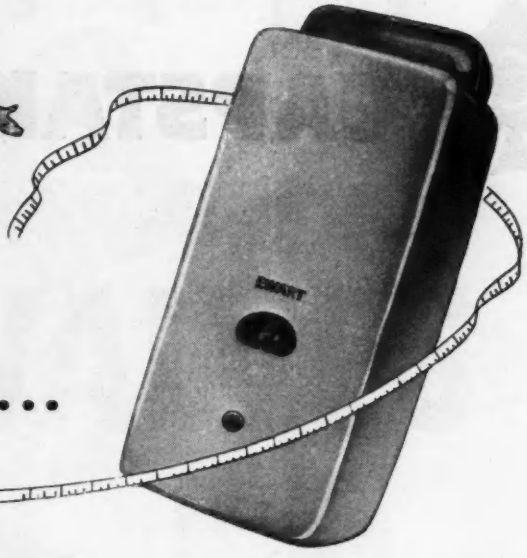
Illustration by courtesy of N.C.B.

A recent installation of three 8" Stroke Vertical Reciprocating Compressors, each machine capable of passing 87,500 cubic feet of gas per hour, against 20 lb. per square inch outlet pressure, running at 450 r.p.m., direct coupled to a National Vertical Oil Engine.

Made by...

THE BRYAN DONKIN COMPANY LTD. CHESTERFIELD

MEMBER OF THE SOCIETY OF BRITISH GAS INDUSTRIES



made to measure...

FRY'S SOLDERS & FLUXES

EWART

Ewart could not risk using any old "reach-me-down" solder on their water heaters. Conditions are arduous and satisfactory performance must be absolutely assured. So of course they use Fry's solder and soldering fluid specially "tailored" for each process.

FRY'S *Service and Advice Bureau is available for solving your problems... ...write or phone to-day*

SOLDERING SIMPLY MEANS FRY'S

Export enquiries invited

FRY'S METAL FOUNDRIES LTD

Tandem Works, Merton Abbey, S.W.19. Tel: MITcham 4023

and at MANCHESTER · GLASGOW · BRISTOL · BIRMINGHAM AND DUBLIN

AS 7

ELECTRIC

CAPSTAN WINCHES

Built with accepted ACE reliability, the conservative rating and generous proportions of these robustly constructed winches guarantees continuous, trouble-free operation at full load. Designed for box enclosure or direct mounting in pit, they are ideally suited for truck and barge haulage in railway sidings, docks and harbours; and for moving furnace bogeys, mining trucks and kiln cars.

Capacity **1 to 5 tons**
Rope Speeds
45 to 160 ft. per min.
For A.C.
or D.C. operation

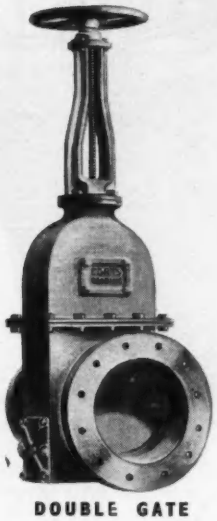
Variable speed units employing dual motors can be supplied against specific enquiries.
FREE RUNNING FAIRLEAD ASSEMBLIES ARE AVAILABLE.
Please write for descriptive Leaflet No. 9667

ACE
ELECTRIC CAPSTAN WINCHES

—always pull their weight

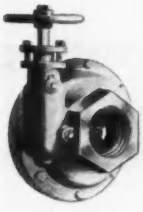
A.C.E. MACHINERY LIMITED., HARLEQUIN AVENUE, GREAT WEST ROAD, BRENTFORD, MIDDX
Telephone: EALing 4262 (5 lines) And at BRIXTON, S.W.2.

CORT'S GAS VALVES



DOUBLE GATE

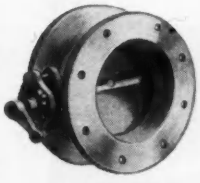
TOWNDROW ROTARY



TOWNDROW SERVICE

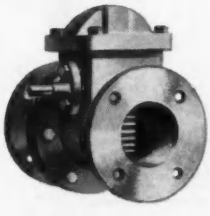
Cort's keep large stocks and so ensure prompt service

SYPHON COCK



THROTTLE

LIQUOR

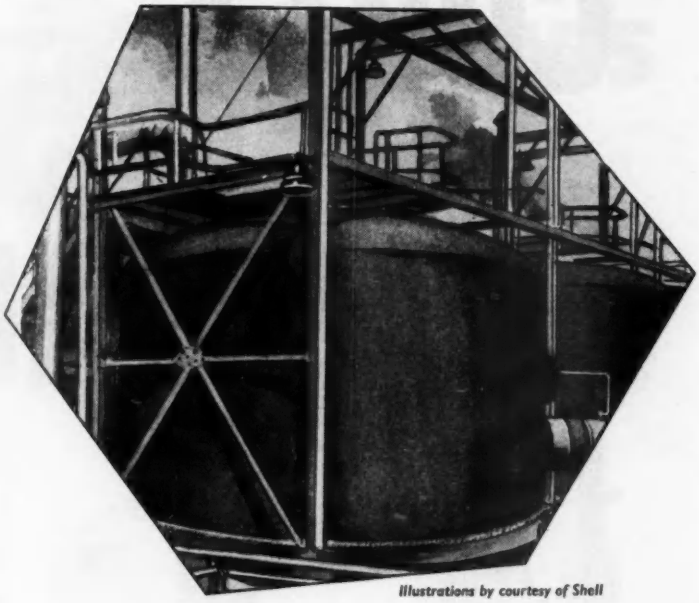


RACK AND PINION

ROBERT CORT & Son Ltd

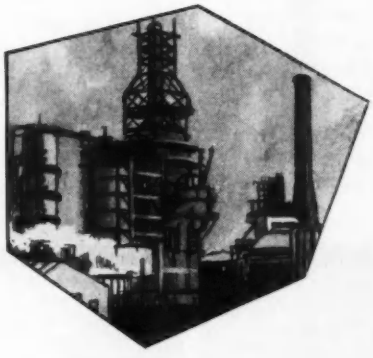
READING · ENGLAND

Telephone: Reading 5046 (5 lines) Telegrams: "Carts, Reading"



Illustrations by courtesy of Shell

An outstanding development . . .



Hydrogen sulphide is extracted from the gaseous fractions produced in the catalytic cracking unit at Stanlow Refinery and converted in Claus kilns to elemental sulphur of 99.9% purity.

The kilns produce sulphur at the rate of over 10,000 tons per year and at a recovery efficiency exceeding 98%.

Peter Spence & Sons Ltd., as suppliers of the catalyst, are proud to be associated with this successful Shell project.

SPENCE

CHEMICALS FOR INDUSTRY

PETER SPENCE & SONS LTD · WIDNES · LANCS

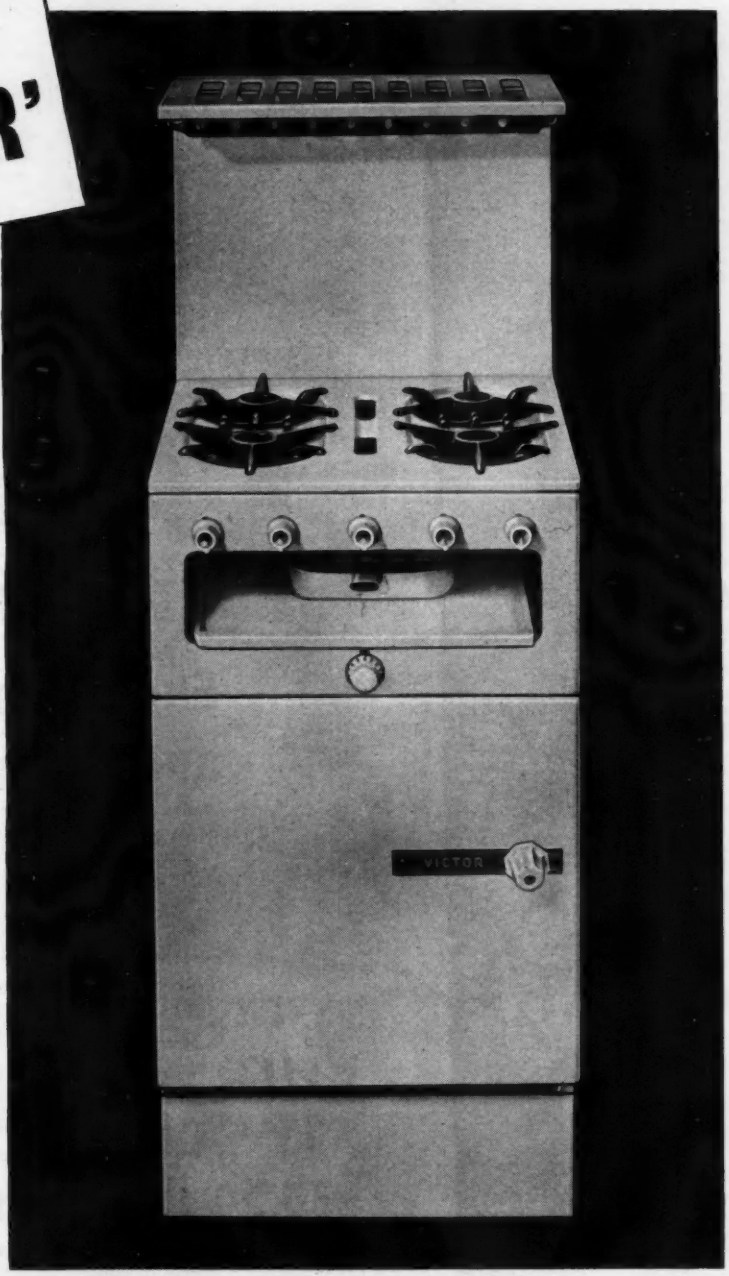
ALSO AT LONDON AND BRISTOL

503

General Gas lead the way again . . .

a LUXURY COOKER at a NON-LUXURY PRICE

THE 'VICTOR'



FIRST General Gas gave you the Junior General 'baby' cooker, for the many who live in small quarters . . .

THEN General Gas created The Raymond, for those who can afford the finest . . .

NOW General Gas bring you another winner... this gas cooker with the luxury look and features, at a price for the millions . . . the 'Victor', the lowest price luxury gas cooker since the war.

with all these luxury features . . .

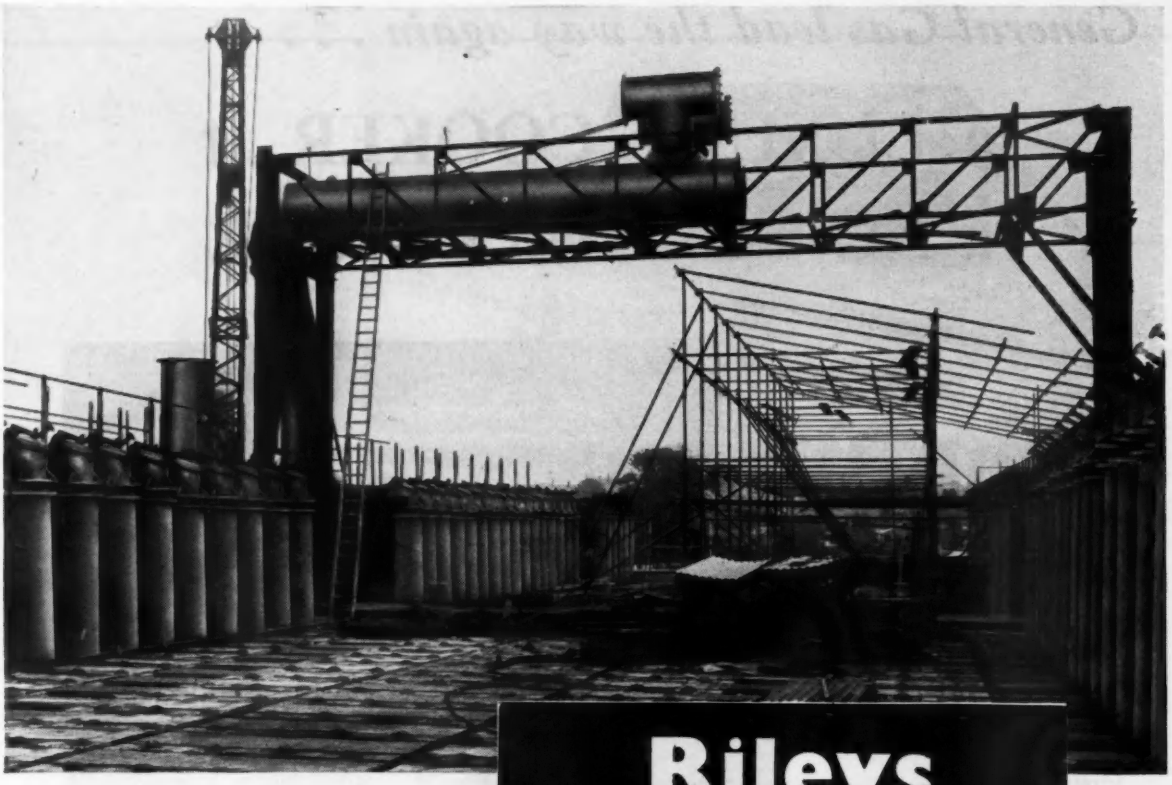
- all white, all cream, or green and cream high-grade enamel finish throughout.
- removable plate rack and hotplate
- 4 boiling burners and grill
- interchangeable removable pan supports
- 16″ oven with 2 grid shelves, roasting pan, cake tray (oven enamel-lined)
- self-latching oven door
- pedestal base with removable front

Show them the **'VICTOR'** *first!*

Manufactured by **GENERAL GAS APPLIANCES LTD., AUDENSHAW, MANCHESTER,** *and* **THE FORTH & CLYDE & SUNNYSIDE IRON COS. LTD., FALKIRK, STIRLINGSHIRE**

(Proprietors: Allied Ironfounders Ltd.)

REGD. TRADE MARK



Rileys of Batley

5 Unit Tubular Condenser
10' high. Weight 4½ tons.

Engineers to the Gas and Allied Industries

Also specialists in the production of welded fabrications, riveted work, etc.

The above illustration (shown by permission of the Woodall Duckham Construction Co. Ltd). shows the erection of the offtake and suction mains over the battery and the pullman valves and ascension pipes to the collecting mains. In the background scaffolding has been erected for a temporary roof over the battery. We invite your enquiries whether they be for construction work, extensions, or entirely new installations. We have 65 years of specialised experience.

A. J. RILEY & SON LIMITED
VICTORIA WORKS, BATLEY, YORKSHIRE

Telephone: Batley 657 (3 lines). Telegrams: Boilers, Batley.

IN ASSOCIATION WITH JAMES AUSTIN & SONS (DEWSBURY) LTD.

RTB
STAFFORDSHIRE BEST CHARCOAL
TINNED SHEETS & TIN-PLATES,
HEAVILY COATED WITH PURE TIN
BY A SPECIAL PROCESS.

HUWOOD CONVEYORS

reduce coke storing charges

Illustration shows Huwood Top-Belt Conveyor stacking coke at the Howdon Works of the Northern Gas Board.

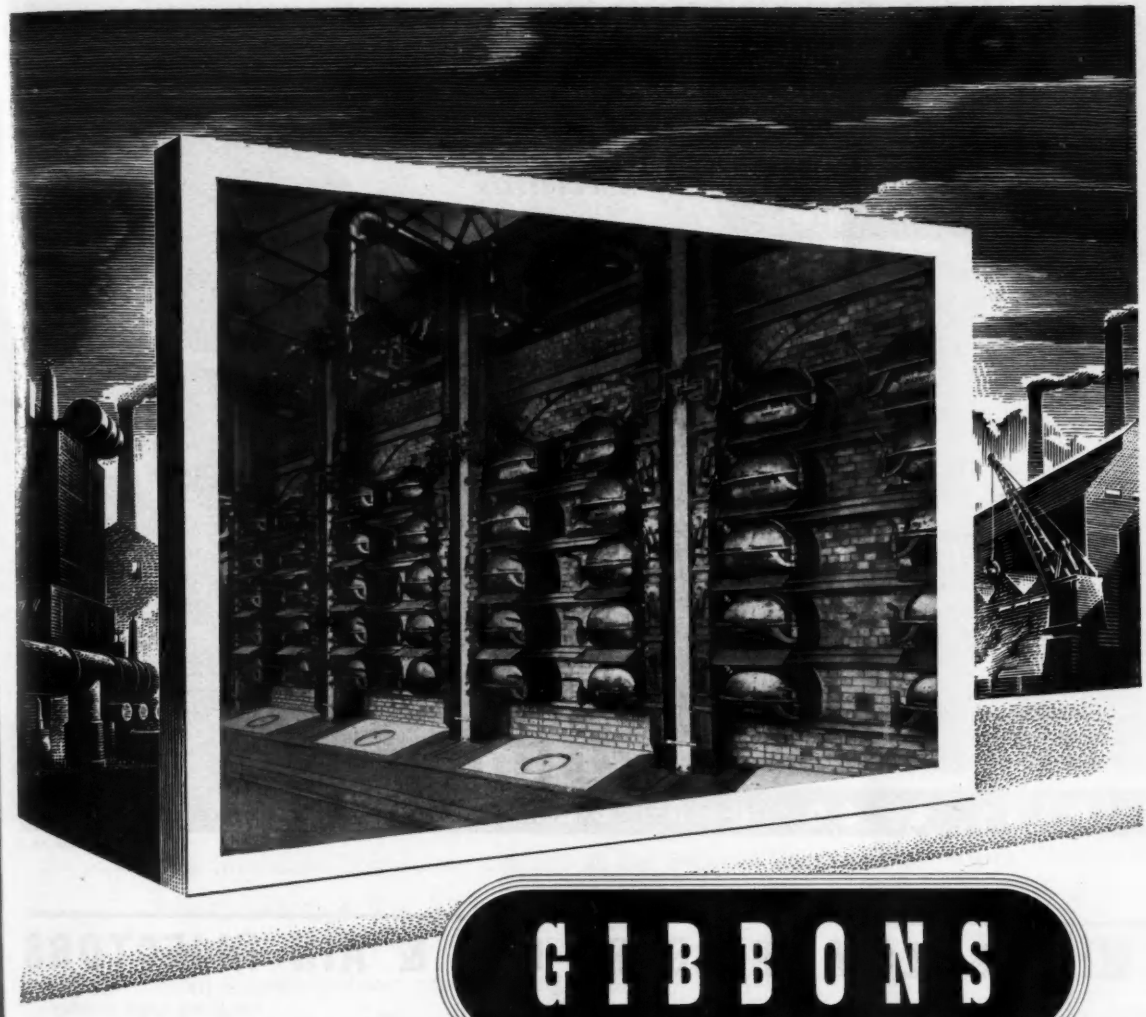
Huwood Conveyors can be designed to suit any individual requirements

Head Office and Factories: **HUGH WOOD & CO. LTD., GATESHEAD-ON-TYNE, 11**

TELEGRAMS: HUWOOD, GATESHEAD TELEPHONE: LOW FELL 76083 (6 LINES)

Industrial and Export Office: **Hugh Wood & Co. Ltd., Dashwood House, 69 Old Broad St., London, E.C.2**

TELEGRAMS: HUWOOD, AVE, LONDON TELEPHONE: LONdon Wall 6631-3-3 (3 LINES)



GIBBONS

EQUIPMENT

For Efficiency and Fuel Economy

DESIGNERS AND MANUFACTURERS OF:

FURNACES AND HANDLING PLANT, GAS PRODUCERS,
COKE OVENS, GAS WORKS PLANT, DRESSLER TUNNEL
KILNS AND REFRACTORIES.

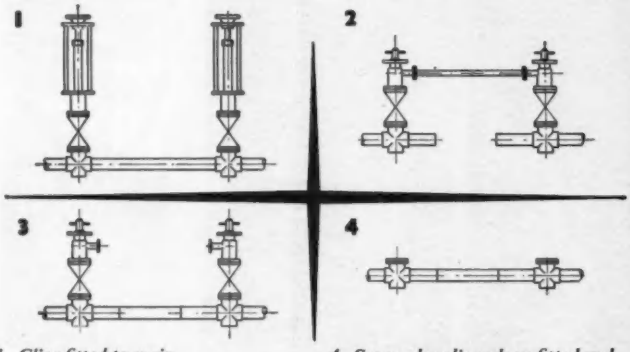
GIBBONS BROTHERS LTD. DIBDALE WORKS · DUDLEY · WORCS.

Telephone: DUDLEY 3141

PIPE LINE PLUGGING

by PASS GAS AND WATER ENGINEERS *The Underpressure Specialists*

This latest development enables sections of the main to be isolated and faulty valves, fittings or corroded sections replaced or overhauled under-pressure.



1. Clips fitted to main.
2. Plugs and By-pass fitted.
3. New section inserted.
4. Screwed sealing plugs fitted and cover plates bolted to clips to complete the job.

Send for fully detailed literature

E PASS & CO LTD DENTON MANCHESTER

dm rA. 6

'WILKES' LOW PRESSURE GAS & AIR INJECTORS

Wilkes Gas & Air Injectors are available in a wide range for use with Gas furnaces of all types and descriptions and are especially suitable for use with enamelling stoves, furnaces, bar burners, heating tanks, etc. Let us have details of *your* particular requirements.

B.3005
Standard pattern variable gas consumption injector, has been designed to operate efficiently on all gas pressures.
The jet is adjusted by a milled cap to give any desired consumption within the specified range, and is locked in position by a locking ring. Control of the air is effected by a split milled ring on the body of the injector.

B.3007
Superior, patented variable gas consumption injector has an internal locking device so that when the desired maximum gas flow is obtained it cannot be altered or interfered with unless the outer protecting cap is removed.
Minimum restriction to the gas flow is achieved with this new and novel design, and in this case the gas connection is at right angles to the outlet.

B.3005. B.3007.

The Alcosa Range includes:—

AIR GAS MIXERS FOR WIDE RANGE OF HEAT TREATMENT PLANTS, GAS BURNERS, GAS FIRED FURNACES FOR FORGING, HARDENING, ANNEALING, WELDING AND MELTING. HIGH SPEED BRAZING APPARATUS SOLDERING AND BRAZING EQUIPMENT. TINNING BATHS. ALSO THE NEW WILKES B.2106S.L. BLOWPIPE

Write for lists **A.H.WILKES & CO.** *and full details*

A SUBSIDIARY OF WILLIAM ALLDAY & CO., LTD.

THE MOST DEPENDABLE NAME IN GAS APPLIANCES

ALCOSA WORKS · STOURPORT-ON-SEVERN · WORCESTERSHIRE · TELEPHONE: STOURPORT 311-4 · TELEGRAMS: YADALL STOURPORT
LONDON OFFICE & WORKS · CRESSWELL WORKS · SOUTH NORWOOD · S.E.25 · TELEPHONE: ADDISCOMBE 1161

Impressive outline

Impressive output

This impressive installation erected at the Beckton Works of the North Thames Gas Board comprises four Carburetted Water-Gas Plants constructed by Humphreys & Glasgow Limited. The building achieves a massive beauty which is the more remarkable in an essentially functional building—literally erected around the four Plants.

The Gas Plants are equally impressive, the four sets having a capacity of 18 million cubic feet of 500 B.Th.U. gas per day. They are fully automatic and are operated by hydraulic power governed by a mechanical controller. Each set in continuous operation makes approximately 10,000 sequence value movements per day.

This is where the Lockheed hydraulic equipment comes into the picture—opening and closing the various valves at the bidding of the mechanical controller.

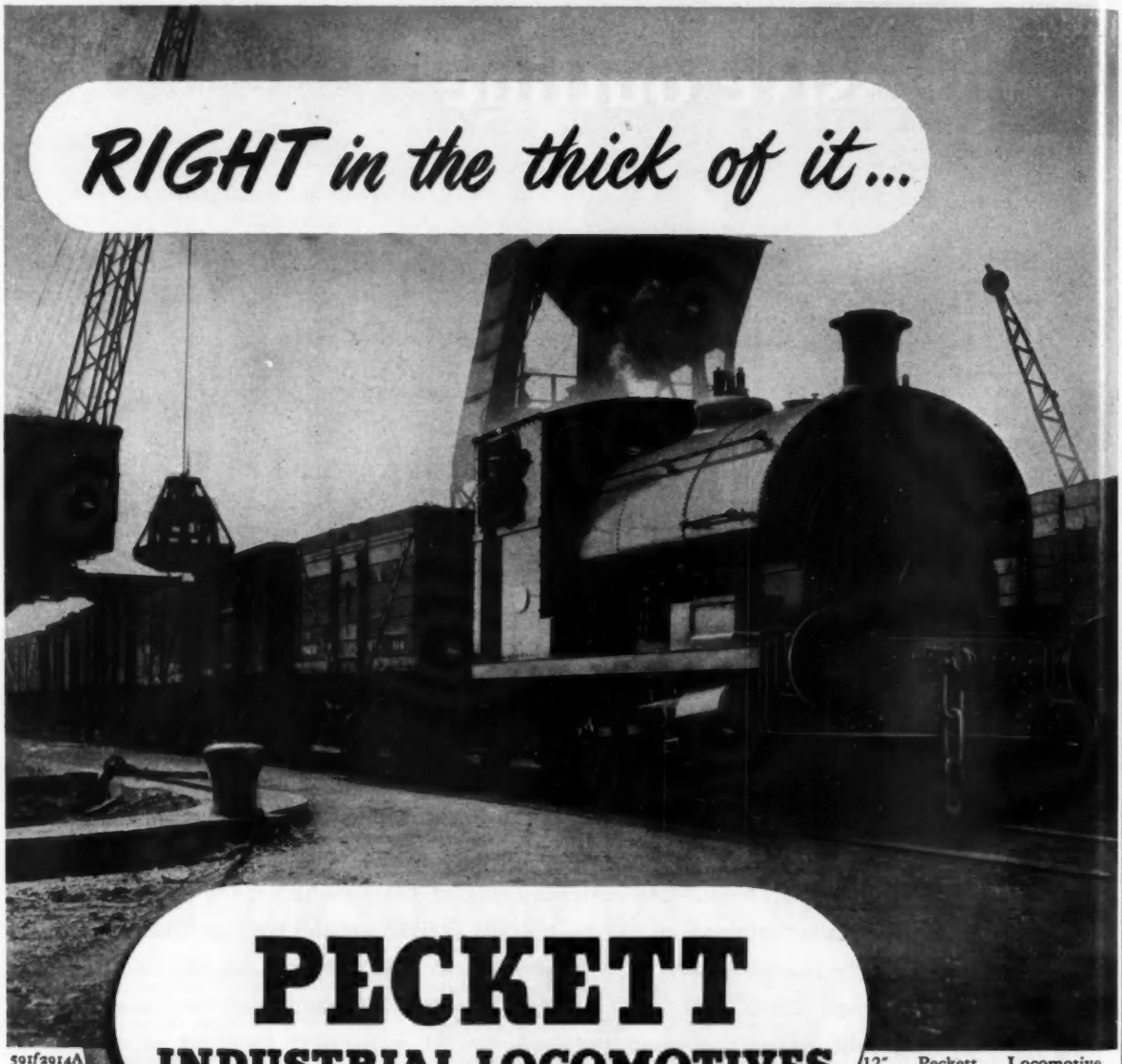
It is significant that Humphreys and Glasgow Limited—designers and builders of this and many other gas plants—should again choose Lockheed hydraulic equipment.

AUTOMOTIVE PRODUCTS COMPANY LIMITED, LEAMINGTON SPA, ENGLAND

Lockheed

REGD. TRADE MARK

INDUSTRIAL HYDRAULICS



591f2914A

12" Peckett Locomotive working at Dibles Wharf for Messrs. Southern Wharves Limited

PECKETT

INDUSTRIAL LOCOMOTIVES

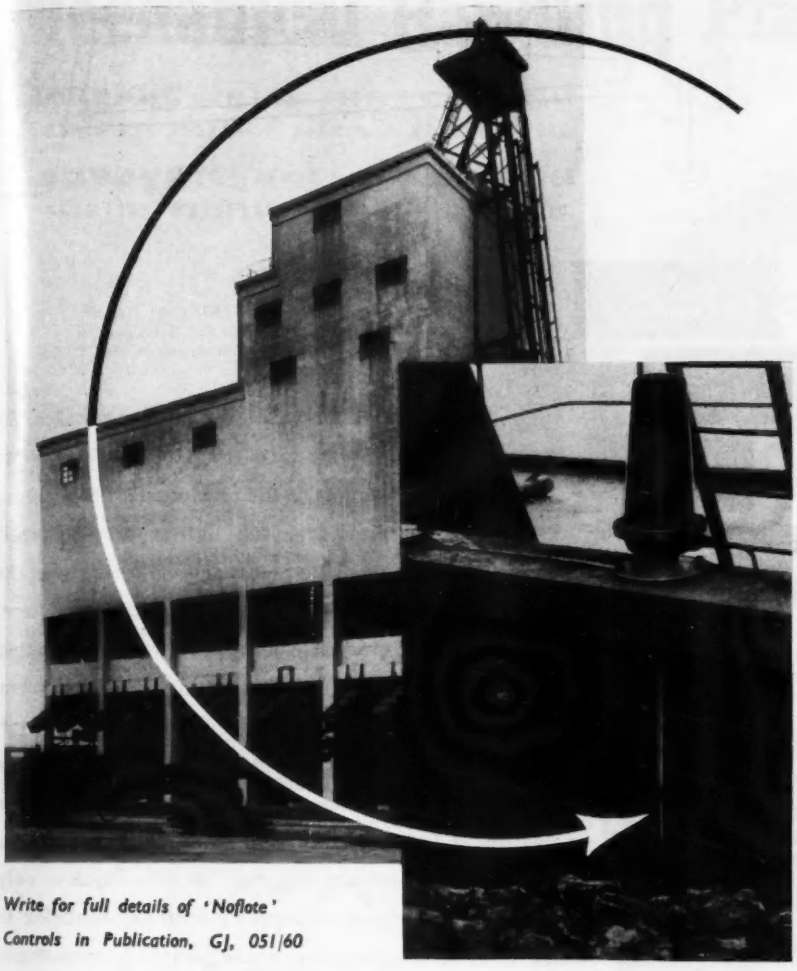
Right in every sense . . . in design, in robust construction and for low upkeep backed by efficient parts replacement service. . . . Peckett locomotives give unflagging service under the most arduous conditions.

Standard designs are fulfilling operational requirements in many industries, including Steel Works, Ship Yards, Quarries and the Nationalised Coal, Gas and Electricity Undertakings, whilst special designs serve the feeder lines of Industry on every continent.

London Representatives:
Ferguson & Palmer, 9 Victoria Street, Westminster, S.W.1.

PECKETT & SONS LTD., ATLAS LOCOMOTIVE WORKS, BRISTOL, ENGLAND

Telephone: Fishponds Bristol 55346 Telegrams: Peckett, Bristol



REMEMBER POPPY DAY

'NOFLOTE' CONTROL for COKE SCREENING PLANT

Write for full details of 'Noflote' Controls in Publication, GJ, 051/60

The passage of coke through the Eastern Gas Boards' Ponders End screening plant is controlled automatically by 'Noflote' Controls. The system, which has been in satisfactory operation since March 1949, eliminates piling up due to blockages in hoppers and chutes, and greatly facilitates unattended operation.

Twin skip hoists feed coke into the main hopper, the intake being automatically stopped when the coke 'bridges' the two 'Noflote' electrodes, and allows a small electric current to be passed between them. The motor starter circuit is broken and spilling thus avoided. The same method of control is also utilised on the scalping screens and in the nearby producer hoppers.

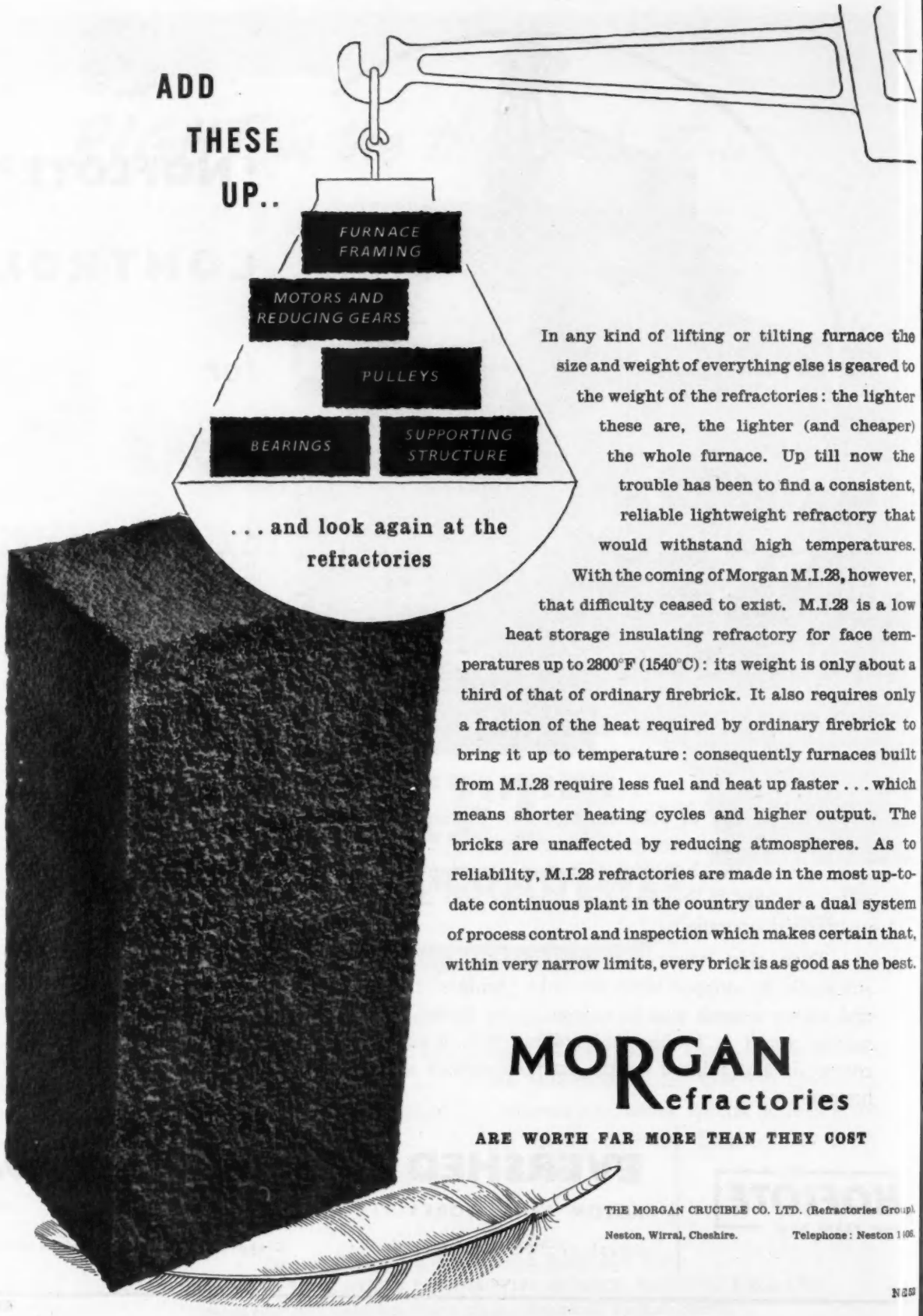
NOFLOTE TRADE MARK

EVERSHED & VIGNOLES LTD.

ACTON LANE WORKS · CHISWICK · LONDON · W4

Telephone: Chiswick 3670 · Telegrams: Megger, Chisk, London

6/96



In any kind of lifting or tilting furnace the size and weight of everything else is geared to the weight of the refractories: the lighter these are, the lighter (and cheaper) the whole furnace. Up till now the trouble has been to find a consistent, reliable lightweight refractory that would withstand high temperatures. With the coming of Morgan M.I.28, however, that difficulty ceased to exist. M.I.28 is a low heat storage insulating refractory for face temperatures up to 2800°F (1540°C): its weight is only about a third of that of ordinary firebrick. It also requires only a fraction of the heat required by ordinary firebrick to bring it up to temperature: consequently furnaces built from M.I.28 require less fuel and heat up faster . . . which means shorter heating cycles and higher output. The bricks are unaffected by reducing atmospheres. As to reliability, M.I.28 refractories are made in the most up-to-date continuous plant in the country under a dual system of process control and inspection which makes certain that, within very narrow limits, every brick is as good as the best.

MORGAN Refractories

ARE WORTH FAR MORE THAN THEY COST

THE MORGAN CRUCIBLE CO. LTD. (Refractories Group)
Neston, Wirral, Cheshire. Telephone: Neston 1406.

N.59

Mechanical Handling Plant

Elevators BELT AND BUCKET · SWING TRAY
CHAIN AND BUCKET · BARREL · PORTABLE, etc.

Conveyors APRON · BAND · GRASSHOPPER
DRAG LINK · PUSHPLATE · SLAT · SPIRAL · TRAY, etc.

★ *Our Technical Department is at your service if you are interested in labour-saving devices and in speeding production.*

We are designers and manufacturers of all types of handling equipment, conveyors, elevators, screens and bunkers. Also all types of foundry mechanised and re-conditioning plants.

Catalogue on application

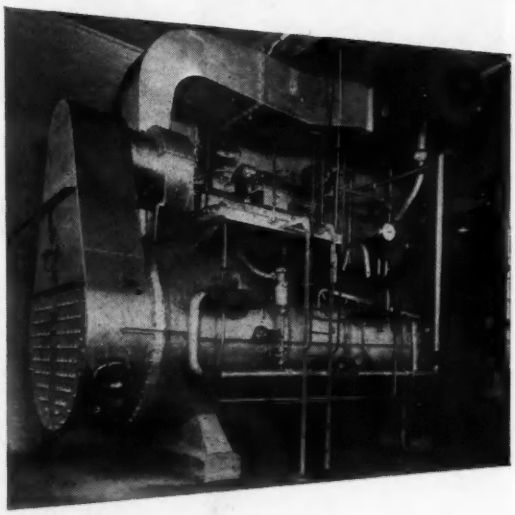
MARCO CONVEYOR & ENGINEERING CO. LTD., ROWIN WORKS, LYNN ROAD, LEYTONSTONE, LONDON, E.11
Tel.: Leytonstone 2254/5. Grams: Engimarco, Easphone. Midland Office, 3 Bond St., Hockley, Birmingham 19. Tel.: Central 2917
North East coast and Yorkshire representative: Mr. E. B. CROFTON, Grove House, Chester-le-Street, Co. Durham

For efficient and economical handling, it pays to consult **MARCO**

CL2

SPENCER-BONECOURT

Waste Heat Recovery Plant



The illustration shows one of the Six Waste Heat Boilers installed at the Howdon-on-Tyne Gasworks—Northern Gas Board. Photograph by courtesy of Messrs. Gas Chambers & Coke Ovens Ltd.

SPENCER - BONECOURT LIMITED

14, FETTER LANE - LONDON - E.C.4

Telephone: CENtral 0481/2 Telegrams: "Bonecourt, Fleet, London."

KIRKHAMS of MANSFIELD

invite your enquiries for

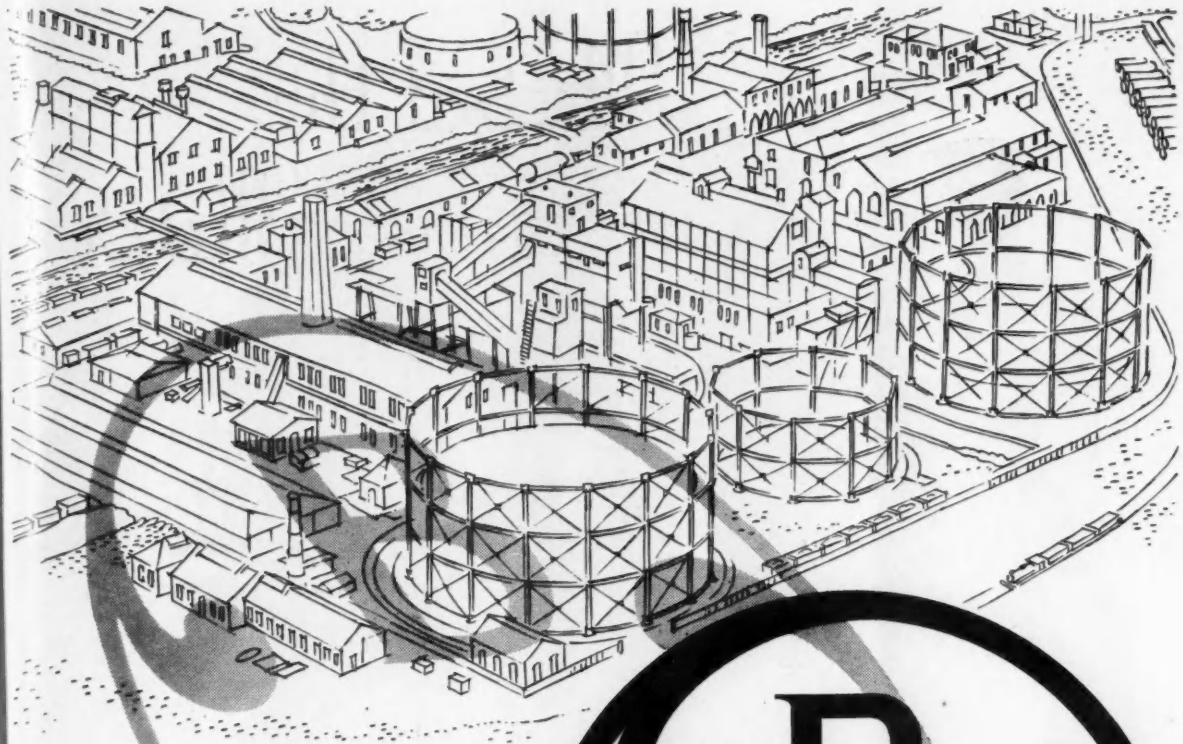
GAS PLANT

PURIFIERS
WASHERS
CONDENSERS
PREHEATERS
BENZOL PLANTS
TAR EXTRACTORS

KIRKHAM, HULETT & CHANDLER, LTD · UNION FOUNDRY · MANSFIELD

STAFFORD HOUSE · NORFOLK STREET · STRAND · LONDON · W.C.2

MANSFIELD 1256-7 TEMPLE BAR 9910



B
T-H

The Symbol on the Best Electrical Equipment

The gas industry depends for its efficiency upon the proper working of a great deal of specialised plant, much of which is electrically driven. BTH have a name in the industry for producing electrical plant which is particularly reliable and well fitted for its task.

But gas is only one field in which the specialisation and long experience of BTH have built up an enviable reputation. It is the same in power generation, traction, marine engineering, mining, the aircraft industry—wherever first-class electrical products are needed.

With fifty-four years' experience and eleven factories, BTH can give outstanding service to industry in every sphere of electrical engineering.

THE
BRITISH THOMSON-HOUSTON
COMPANY LIMITED, RUGBY, ENGLAND

A 4152
B

Meet at the Wilson Meter

Whatever the attraction, a quiet night at home, or with a friend at the club, in some unseen corner—close at hand—a gas meter is carrying out its life long task. Often it's a Wilson.

ONE OF BRITAIN'S BACKROOM BOYS

GEORGE WILSON
GAS METERS LTD.

COVENTRY JARROW LONDON MANCHESTER WOLVERHAMPTON TROON
(Depot)

.... completely, rapidly, under the influence of ATLAS GREESKILLA.

This modern industrial detergent will cope with practically every degreasing job in engineering—ranging from plant *in situ* to machinery parts, gear wheels, bolts and nuts, etc. ATLAS GREESKILLA is a powder which readily dissolves in hot water. Although powerfully effective it is so mild that it will harm neither hands nor fabrics. Send now for descriptive literature of this truly economical degreaser.

ATLAS GREESKILLA
DEGREASER & CLEANSER

ATLAS PRESERVATIVE CO. LTD., ERITH, KENT. 'Phone: ERITH 2255 (3 lines) 'Grams: Deoxydizer, Erith
TAS/AS 113

Illustrated is the 200 c. ft. Dry Demonstration Meter in tinplate case.

IMPORTANT MEASURES

The 'A & M' DRY DEMONSTRATION METER

This meter is particularly useful for cookery or other demonstration purposes. The dial is 9" in diameter, and the meter is available in a variety of sizes. Complete details will be sent on request.

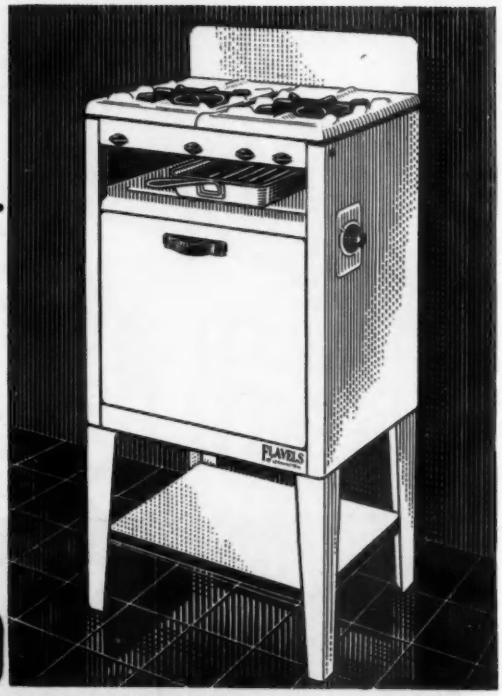
ALDER & MACKAY LTD
Makers of Meters
New Grange Works, Edinburgh
LONDON · BRADFORD · MANCHESTER · BELFAST · CORK

The little Cooker
with the big performance..

The Perfect Cooker for the "one roomer" or the small flat where space is at a premium. Compact, efficient and attractively finished in gleaming **CREAM** porcelain enamel.

Modestly priced and capable of cooking for one to four people.

The **IMP** **GAS COOKER**



★ **Supplied with or without oven heat control**

A product of
FLAVELS of LEAMINGTON *Makers of fine quality cooking and heating appliances since 1777*

the first name in mechanical shovelling

The pioneering of thirty years has gone into the latest Chaseside shovel — and nothing can replace those thirty years of shrewd, specialised, engineering "know-how". That indeed is why the present Chaseside is exactly as it is—in no other way, we have found, can a shovel be made so tough, so powerful; in no other way can it be made so simple, so reliable, and so economical in overall cost-per-ton-handled whether on heavy work or easy. We are always happy to prove this, though the purchase by Gas Undertakings of some 225 Chaseside Shovels is in itself significant . . .

LIFT. *Like big power shovels the Chaseside scoop is cable operated—but with hydraulic "finger-tip" controls.*

ACTION. *The scoop digs fully, straight into the heap. The buffer bar, backing up the scoop, throws the whole weight of the machine into the operation.*

SPEED. *Comparative tests show that the Chaseside can* dependably *handle most tons per hour.*

COSTS. *In overall economy, and in staying power, the Chaseside is without equal.*

and the last word in shovels

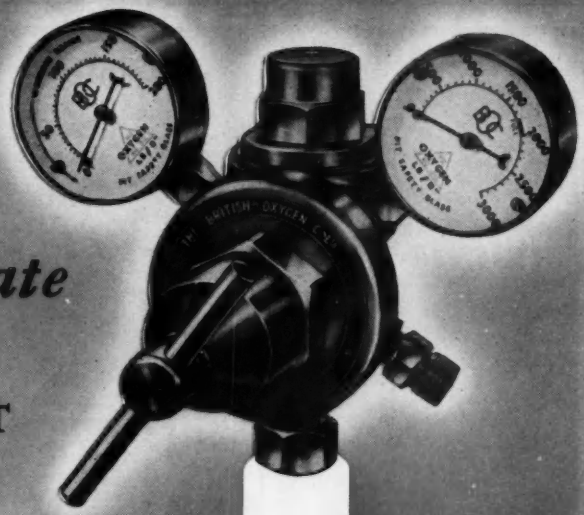
CHASESIDE

Chaseside Engineering Co. Ltd., Station Works, Hertford, Hertfordshire. Telephone: Hertford 3113 (6 lines). Service Factories at Church St., Ware, Herts. 'Phone: Ware 720 and Failsworth, Manchester. Telephone: Failsworth 3070.

CLEARLY

the most accurate

...CLEARLY THE BEST



B.O.C Regulators are now more sensitive and more accurate than ever . . . with new-pattern valves, improved diaphragm material, efficient disposition of working parts, and easily-read gauges fitted with shatter-proof glass. The body is strongly constructed from a hot brass stamping, and the outlet at the bottom gives a natural fall to the hose to avoid kinking. This sensitive, stable, robust and accurate B.O.C instrument will be welcomed by welding and cutting operators . . . in every Industry.

TYPE B

REGULATORS

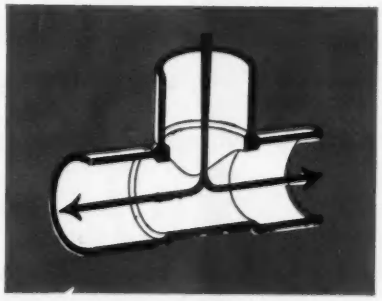
FULL DETAILS FROM

THE BRITISH OXYGEN CO LTD

LONDON & BRANCHES

Ideal *improved* full-way fittings

FOR USE WITH COPPER TUBE. Ideal Improved Full-way Fittings are TINNED THROUGHOUT and ready for immediate use. No cleaning is necessary, therefore no time is wasted by having to scour with steel wool on the inside to prepare them for soldering. This reduces the possibility of imperfect joints caused through faulty cleaning and overcomes frayed tempers or fingers brought about when working with small-bore tubes and fittings. Besides the reduction in installation costs there is less possibility of corrosion. They provide free, unrestricted flow as the tube seats against the shoulder of the sockets in the fitting and the bore is therefore flush throughout. They are unaffected by hot water or by temperatures below freezing point and the joints are actually stronger than the tube itself. Most suitable for use in confined spaces they are uniform and interchangeable and manufactured for use with light gauge copper tube to No. B.S.S. 659 and B.S.S. 1386.



A new illustrated booklet giving full details and prices of the complete range of fittings and accessories is available from our Builders' and Plumbers' Merchants' Stockists in all districts.

If there is any difficulty in obtaining a copy, please write direct to the address below.

IDEAL-Standard

Manufactured by

IDEAL BOILERS & RADIATORS LTD · IDEAL WORKS · HULL

243

Visit our Stand, 310, Row Q, National Hall, at the Building Exhibition, Olympia

ETHER Solenoid Valves

AUTOMATIC CLOSING
ELECTRICALLY OPENED TYPE A.C.

Ether Solenoid Valves Type A.C., open electrically when energised and automatically close when de-energised. They are, therefore, suitable for use in conjunction with Thermostats or Pyrometers for automatically regulating the heat input to a furnace by controlling the gas supply.

Since they close automatically on electrical failure, they are also largely used in conjunction with combustion safeguard devices.

Send for
LIST No. 351
giving full details

FEATURES OF TYPE A.C. VALVES

- Glandless construction—friction and leakage eliminated.
- Soft composition seat giving 100 per cent. shut-off.
- Liberal power rating ensures safe operation even during power cuts.
- Gunmetal and phosphor bronze fittings eliminate corrosion.

Ether Solenoid Valves, Type A.C., are made in all sizes up to 6 in.

Valves up to 3 in. have female threads—above 3 in. flanged connections.

ETHER LIMITED
TYBURN RD. ERDINGTON
BIRMINGHAM 24
Telephone - - EAST 0276-7

Holdens

Welding, Gunning & Spraying of GAS RETORTS

Write for particulars of how E.B. Service can help in reducing maintenance costs.
Manufacturers of all types of Cements.

EB

E.B. REFRACTORY CEMENT CO. LTD.
OAKFIELD OFFICES, BRETTELL LANE, STOURBRIDGE

THOMAS BUGDEN & CO.
India-Rubber and Airproof Manufacturers and General Contractors.
LARGEST MANUFACTURERS OF GAS MAIN BAGS.
Telegrams—"Airproof, Baks, London." Telephone—6147 Clerkenwell

Contractors to H.M. Government

Gas Bags for Repairing Mains

PATENTEES OF THE
DENMAR BAG
Impervious to Main Liquor and Climatic Influences.

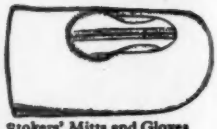
Round or Cylinder Shape.

Pull-through and Expanding MAIN STOPPERS.

All types of INDIA-RUBBER BOOTS.

DRAIN RODS AND WHALE-BONE BRUSHES.

HOSE AND TUBING FOR ALL PURPOSES.



Stokers' Mitts and Gloves of every description.

Contractors' & Miners' Woollen Jackets, Trousers, Hats, &c.

244, Goswell Road, LONDON, E.C.1.

S/N/F/T/I
Copper Tubes for Housing

MT9 *Photo: By courtesy of the Director of Housing, Corporation of Glasgow.*

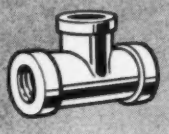
Solid drawn copper tubes for domestic water and gas services and electrical conduit. Specify B.S. 659/1944 for water and gas services ; B.S. 1386/1947 for underground water services and B.S. 840/1939 for electrical conduit.

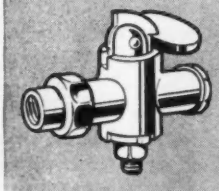
SCOTTISH NON-FERROUS TUBE INDUSTRIES LIMITED
SALES OFFICE : 4, BLYTHSWOOD SQ., GLASGOW, C.2
TELEPHONE: DOUGLAS 7020 WORKS: HILLINGTON, GLASGOW, S.W.2.

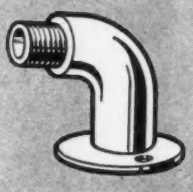
EDGAR

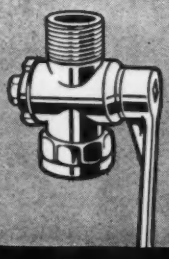
GAS FITTINGS & APPARATUS

Famous for over Half a Century



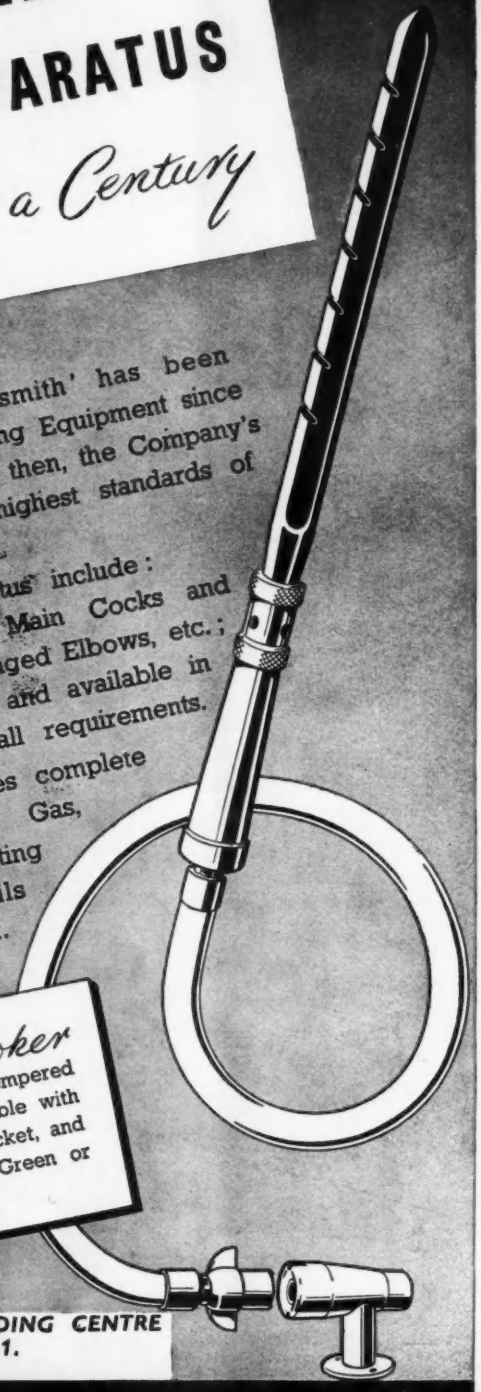






The name 'Edgar's of Hammersmith' has been famous for Gas Fittings and Lighting Equipment since the turn of the century. Today, as then, the Company's products ably contribute to the highest standards of gas efficiency.

Edgar Gas Fittings and Apparatus include: Flexible Plugs and Sockets; Main Cocks and Union Cocks; Equal Tees; Flanged Elbows, etc.; all made to B.S. specification and available in a complete range to meet all requirements. Edgar's service also embraces complete Street Lighting Equipment; Gas, Hot Water and Central Heating Installations. Full details gladly given on request.



EDGAR'S *'38' Gas Poker*

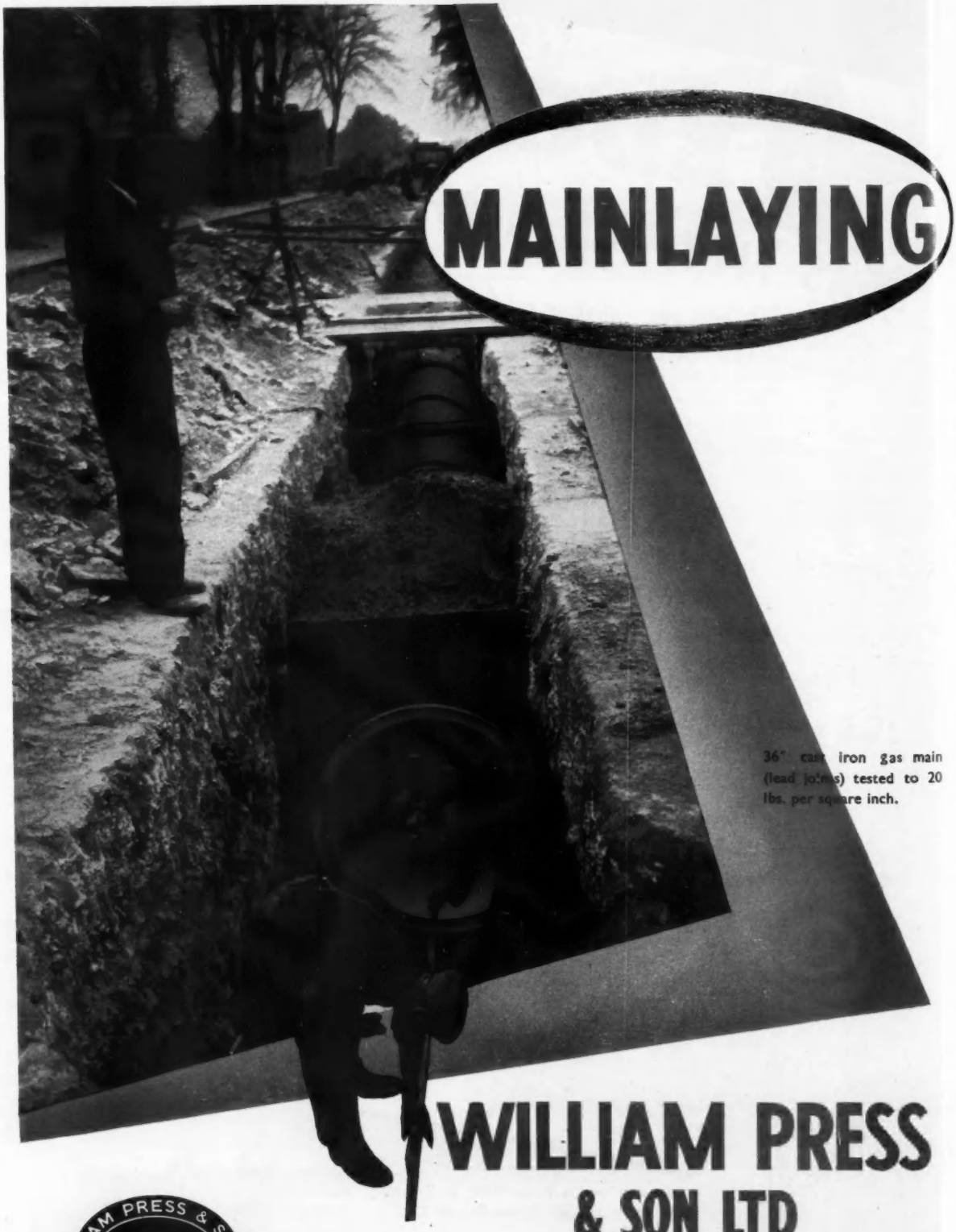
is a de luxe poker with specially tempered steel blade for long life. It is usable with British Standard Flex Plug and Socket, and is supplied with handles in Red, Green or Black Bakelite.

See our exhibit at THE BUILDING CENTRE 26, Store St., W.C.1.

WILLIAM EDGAR AND SON LIMITED

BLENHEIM WORKS, HAMMERSMITH, LONDON, W.6.

Telephone: Riverside 3486



MAINLAYING

36" cast iron gas main (lead joints) tested to 20 lbs. per square inch.

WILLIAM PRESS & SON LTD MAINLAYING

WILLIAM PRESS & SON LTD.

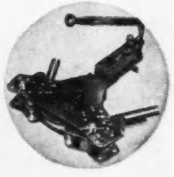
22, QUEEN ANNE'S GATE, WESTMINSTER, S.W.1
Telephone: WHitehall 1752-3 & 2961 Telegrams: Unwater, Parl, London

WILLOUGHBY LANE, TOTTENHAM, N.17
Telephone: TOTtenham 8171-6 Telegrams: Unwater, Southtot, London

. . . for divers bends

WE design and manufacture machines for the bending of all kinds of tubing up to 3" in diameter. With these there is, in addition, a unique bending unit to facilitate the bending of ½" to 2" steam and gas tubing through 180°.

These machines are particularly suited for use with steam and gas tubing — copper tubing—electricians' conduits—light gauge, solid drawn brass tubing—aluminium tubing and light gauge steel tubing. Full service facilities are available and special machines can be designed to order.



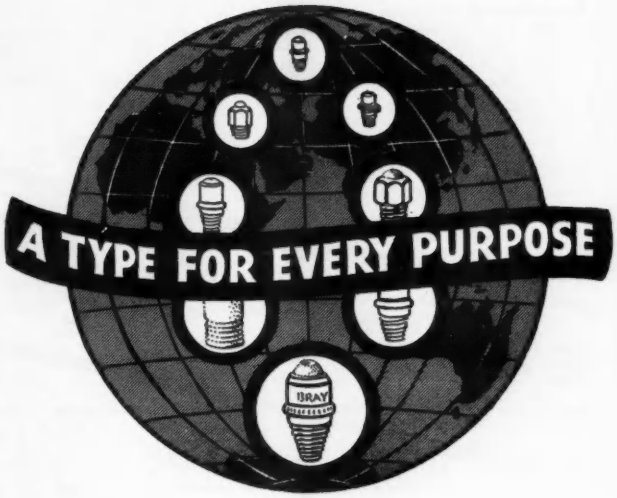
Ask your machine tool distributor or write direct to:

Tubela

Tubela Engineering Co. Ltd.
6 Furze Street, Bow, London, E.3
Telephone : East 4771 (3 lines)

Elwyn Hughes

BRAY GAS JETS



RENOWNED FOR QUALITY REGULARITY OF CONSUMPTION AND HIGH PERFORMANCE

PLEASE WRITE FOR CATALOGUE NO 250

GEO. BRAY & Co. Ltd.

LEICESTER PLACE, LEEDS, 2

Tel. : 20981/9

J. BROWN & CO. LTD.
SAVILE TOWN, DEWSBURY, YORKS.
Supply:–
"BROWNOX-de-LUXE" PURIFYING MATERIAL
Purchase:–
SPENT OXIDE

COMPRESSORS & EXHAUSTERS FOR AIR AND GAS.
See our Advertisement Next Week.
REAVELL & CO. LTD. IPSWICH.

UNDERPRESSURE ENGINEERING CO., LTD.
UNDERPRESSURE CONNECTIONS
SPLIT COLLARS
SOCKET CLIPS
UNION FOUNDRY, MANSFIELD, NOTTS.
ALL TYPES OF DISTRIBUTION MATERIAL IN STOCK
Service Enquiries :
STAFFORD HOUSE, NORFOLK STREET, STRAND, W.C.2.
'Phone: MANSFIELD 1256. *'Grams:* CASTINGS, MANSFIELD.
'Phone: TEMPLE BAR 9910. *'Grams:* WASHER, ESTRAND, LONDON
CENTRAL ACTION DRILL STANDS
SERVICE CLEANSERS
TOOLS, ETC.

COAL AND COKE SCREENING & SIZING PLANTS.
RETORT SETTINGS PRODUCERS, FURNACES REPAIRS.
GOODALL, CLAYTON & Co. LTD.
LEEDS.
CONVEYORS, ELEVATORS, BUNKERS, ROOFS, HOISTS, Etc.

Bind your JOURNAL each week

Gold lettered on the spine complete with instruction sheet.

No loose copies to be mislaid

We offer Journal readers a simple method of temporarily binding their copies as received week by week. No time lost searching for a particular issue; Journals removed and replaced in a few seconds. Designed to hold 13 issues, and whether completely or only partially filled the book effect is always maintained.

Price 12/6 each plus 9d. postage.

Obtainable from:
WALTER KING, Ltd., 11, Bolt Court, Fleet St., London, E.C.4

JUST PUBLISHED - EVERY GAS ENGINEER SHOULD HAVE A COPY...

PRODUCED IN CO-OPERATION WITH THE ROBERTSHAW-FULTON CONTROLS COMPANY, U.S.A.

MANUFACTURED THROUGHOUT IN AN AIR-CONDITIONED FACTORY

MAGNET SURFACES GROUND TO LIMITS NEVER BEFORE ACHIEVED IN QUANTITY PRODUCTION

SEND FOR IT NOW!

-it tells you of the greatest technical advance in BRITISH-MADE shut-off valves

The MONITROL, produced in Britain by Monitor Engineering & Oil Appliances Ltd., is backed on the many years of specialised American experience of the Robertshaw-Fulton Controls Co., U.S.A. It heralds an entirely new conception in BRITISH MADE Automatic Shut-Off Valves.

MAKE PRECISION YOUR DECISION

SEND FOR THIS BOOKLET-NOW!

TO MONITOR ENGINEERING & OIL APPLIANCES LTD.
Stechford, Birmingham, 9.

Please send me a copy of 8 pp. Booklet "The Monitrol Automatic Shut-Off Valve."

NAME.....

ADDRESS.....

A Member of the Parkinson & Cowan Group.

R. & J. DICK LTD.

POWER TRANSMISSION SPECIALISTS

GREENHEAD WORKS
GLASGOW, S.E.

and at
LONDON · BRISTOL · BIRMINGHAM
MANCHESTER · DUNDEE · LEEDS
NEWCASTLE · BELFAST · DUBLIN
U.S.A. WORKS - - PASSAIC

Manufacturers of :-

"DICK'S ORIGINAL" BALATA Belts
For all general purpose drives

"DIXEL" VEE ROPES
Made endless or open for drives up to 3 000 H.P.

"DIXIT" Belting
Acid and Heat Resistant

"RUBERIX" BELTING
Solid Woven from "Filastic" yarn Vulcanised

"DIXADD" BELTING
Combination Belt giving extra power

"DICKROPE"
RUBBER, MOULDED, ENDLESS

Catalogues and Price Lists on application

M & M PATENT METER LOCKS

use the STRONGEST, SAFEST METER LOCK

- DON'T buy locks you may have to scrap in a few years
- DON'T look only at the initial cost
- DON'T think only of the present time; look to the future
- DO remember that good quality is cheapest in the long run
- DO take our word for it that our workmanship is consistently good
- DO profit by others' experience and use M. & M. Locks to protect your meters

H. MITCHELL & CO.
36, 38, NEW CHARLES STREET, LONDON, E.C 1

'FOSALSIL' Insulating Bricks for the Gas Industry

Furnaces and kilns lined direct with Super H.T. consume up to 33⅓% less gas than similar units lined with refractory. Super H.T. bricks possess insulating values up to five times as great, combined with a heat storage capacity less than half that of firebricks.
An integral part of a comprehensive range of insulating bricks designed to cope with all temperatures and conditions Super H.T. has a maximum temperature limit of 1,350°C.

MOLER PRODUCTS LTD.
HYTHE WORKS · COLCHESTER
Telephone: COLCHESTER 3191 (3 lines). Grams: FURMOL, COLCHESTER.

BELFO
BRITAIN'S BEST BELT FOOD

SELEK
METAL TO METAL JOINTING CEMENT

PLASTILOY
PLASTIC METALLIC PACKING

Sole Manufacturers: GRANT & WEST, LTD. 3, FURLONG ROAD LONDON, N.7

Selekjoina, Holway, London North 2160/2111

GAS RETORTS
HARRIS & PEARSON
STOURBRIDGE, ENGLAND
INSULATING BRICKS, RECUPERATOR TUBES, SPECIAL SEMI-SILICA QUALITY FOR SEGMENTAL RETORTS WITH NO EXPANSION OR CONTRACTION AT 1400° C
Manufacturers of
Fire Bricks, Lumps & Tiles
OF EVERY DESCRIPTION

E. C. & J. KEAY, LIMITED

CONSTRUCTIONAL ENGINEERS AND IRONFOUNDERS

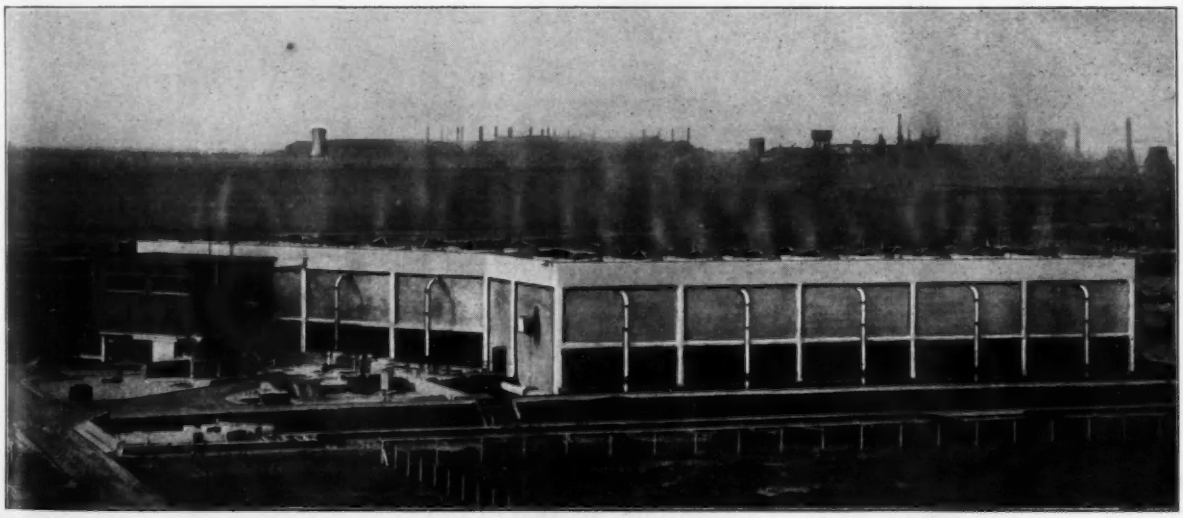
Head Office:
"Runnymede,"
Stratford Road,
Henley-in-Arden,
Warwickshire

Also Offices
at
LONDON
SOUTHAMPTON

Cast Iron Purifiers temporarily erected in our Works prior to despatch

Specialists in Tanks, Steel or Cast-Iron, Riveted or Welded, etc.

JAMES BRIDGE WORKS, DARLASTON



THE ABOVE ILLUSTRATION DEPICTS A WATER COOLING TOWER INSTALLATION OF THE MECHANICAL INDUCED DRAUGHT TYPE. TO ACHIEVE THE VERY EXACTING DUTY SPECIFIED A TOTAL OF 36 FANS ARE EMPLOYED WHICH ARE SITUATED IN THE ROOFS OF THE TOWERS. THE INTERNAL FILLING IS EXCEPTIONALLY COMPACT, CONTAINS THE LATEST IMPROVEMENTS AND IS SO DESIGNED TO MINIMISE OPERATIONAL COSTS. IN THE BACKGROUND TOWARDS THE LEFT CAN BE SEEN A 160 FEET HIGH NATURAL DRAUGHT HYPERBOLIC TOWER FOR A SERVICE REQUIRING A LESS STRINGENT PERFORMANCE.

THESE UNITS ARE ALL PRODUCTS OF

THE DAVENPORT ENGINEERING Co. LIMITED

BRADFORD

WHOSE SPECIALITY IS THE DESIGN AND CONSTRUCTION OF

WATER COOLING PLANTS

"WELL AND
TRULY LAID"

MAINLAYING

Over 30 years' sound experience.

Skilled and gas-minded workmen.

Thousands of miles of mains have been laid by JEAVONS.

E · E · JEAVONS & CO · LTD

TIPTON · · · · STAFFS.

'Phone: TIPTON 2161 (5 LINES) 'Grams: "PIPELINES" TIPTON

INDEX TO 'JOURNAL' ADVERTISERS

A — PAGE
A.C. Machinery, Ltd. ... 70
Abbott, Birks & Co., Ltd. ...
Accurate Recording Instrument Co. ...
Acme Wringers, Ltd. ...
Aerofoam Co., Ltd. ...
Aerograph Co., Ltd. ...
Alder & Mackay, Ltd. ... 88
Allan Taylor (Engineers), Ltd. ...
Ascot Gas Water Heaters, Ltd. ...
Ascot Gas Water Heaters, Ltd. (F.A. Neat) ...
Ashmore, Benson, Pease & Co. ...
Ashworth, Thos., & Co., Ltd. ...
Aspinall's (Paints), Ltd. ...
Associated Lead Manufacturers, Ltd. ...
Associated Lead Manufacturers, Ltd. (Rustodian) ...
Atlas Preservative Co., Ltd. ... 87
Autocontrol Boilers, Ltd. ...
Automatic Telephone & Electric Co., Ltd. ...
Automotive Products, Ltd. ... 79
Averill, C. R., Ltd. ...

B
Bale & Church, Ltd. ... 145
Balfour, Henry, & Co., Ltd. ...
Begvaco Meters, Ltd. ...
Benham & Sons, Ltd. ...
Blakeley Firth, Sons & Co., Ltd. ...
Bolton's Superheater & Pipe Works, Ltd. ...
Booth, John, & Sons (Bolton), Ltd. ...
Boydell E. & Co. Ltd., ...
Bratt Colbran, Ltd. ...
Bray, George, & Co., Ltd. ... 95
Bray, W. E., & Co., Ltd. ...
British Flint & Cerium Manufacturers, Ltd. ...
British Gas Purifying Materials Co. ...
British Oxygen Co., Ltd. ... 90
British Rototherm Co., Ltd. ...
British Thermostat Co., Ltd. ...
British Thomson Houston, Ltd. ... 85
British Tyre and Rubber Co., Ltd. ...
British Vacuum Cleaner & Engineering Co., Ltd.
Broadbent, Thomas, & Sons, Ltd. ...
Brockhouse Heater Co., Ltd. ...
Broom & Wade, Ltd. ... Cover IV
Brown, J., & Co., Ltd. ... 96
Bugden, Thos., & Co. ... 92

C
Cambridge Instrument Co., Ltd. ... 143
Cannon (G.A.), Ltd. ...
Cementation Co., Ltd. ...
Chamberlain Industries, Ltd. ...
Chaseside Engineering Co. Ltd., ... 89
Chemical Engineering Wiltons, Ltd. ...
Chemical & Insulating Co., Ltd. ...
Cinema-Television, Ltd. ...
Clapham Bros., Ltd. ...
Clarke, Chapman & Co. Ltd., ... 131
Clayton, Son & Co., Ltd. ... 120
Clifford Engineering Co., Ltd. ...
Cohen, George, Sons & Co., Ltd. ...
Concentric Manufacturing Co., Ltd. ...
Concrete Proofing Co., Ltd. ...
Consolidated Pneumatic Tool Co., Ltd., ...
Cort, Robert, & Son, Ltd. ... 71
Cox & Danks, Ltd. ...
Crane, Ltd. ...
Crone & Taylor, Ltd. ...
Crosby & Co., Ltd. ...
Crossley Bros. ...
Curtis, A. L., & Co. ... 103
Cutler, Samuel, & Sons, Ltd. ... 136

D
Davenport Engineering Co., Ltd. ...
Davey, Paxman & Co., Ltd. ...
Dawe Instruments, Ltd. ...
De la Rue, Thomas, & Co., Ltd. (Gas Group) ...
Dempster, R. & J., Ltd. ... Cover I
Dempster, Robert, & Sons, Ltd. ... 139
Derbyshire Silica Firebrick Co., Ltd. ...
Diaphragm & General Leather Co., Ltd. ...
Dick, R. & J., Ltd. ... 97
Donkin (The Bryan) Co., Ltd. ... Cover II, 119
Douglas, Robert M., (Contractors), Ltd. ... 130
Douglas, William, & Sons, Ltd. ...
Drakes, Ltd. ...
Dresser Manufacturers (England Ltd.) ...
Drew, H. B., Ltd. ...
Dunlop & Ranken, Ltd. ...
Dunlop Rubber Co., Ltd. (Gen. Rubber Goods Div.) ...

E
E.B. Refractory Cement Co., Ltd. ... 92
Basiclene Porcelain-Enamel (1938), Ltd. ...
Edgar, William, & Son, Ltd. ... 93
Elcontrol, Ltd. ...
Electric Construction Co. Ltd., ... Facing p. 117
Electrofio Meters Co., Ltd. ... 128
Electrolux, Ltd. ...
Elliott Bros. (London), Ltd. ...
English Electric Co., Ltd. ...
Ether, Ltd. ... 92
Evershed & Vignoles, Ltd. ... 81
Evode, Ltd. ...
Ewart Chainbelt Co., Ltd. ...
Expanded Metal Co., Ltd. ...

F
F. C. Construction, Ltd. ...
Fibreglass, Ltd. ...
Flavel, S., & Co., Ltd. ... 88
Fluxite, Ltd. ...
Fowler, John, & Co. (Leeds), Ltd. ...

Franki Compressed Pile Co., Ltd. ... PAGE
Fraser & Chalmers, Engineering Works ...
Fry's Metal Foundries, Ltd. ... 69
Fyffe & Co., Ltd. ...

G
Gas Chambers & Coke Ovens, Ltd. ...
Gas Purification & Chemical, Ltd. ... 145
General Descaling Co., Ltd. ...
General Electric Co., Ltd. ...
General Gas Appliances, Ltd. ... 73
Gibbons Bros., Ltd. ... 77
Gibbons (Dudley), Ltd. ...
Gibson, John, & Son, Ltd.... ...
Glover, George, & Co., Ltd. ...
Glover, Thomas, & Co., Ltd. ... 104
Godfrey, Sir George, & Partners (Industrial), Ltd.
Goodall Clayton & Co., Ltd. ... 96
Goodyear Mechanical Goods ...
Grant & West, Ltd.... ... 98
Graphite Products, Ltd. ...
Green & Boulding, Ltd. ... 145
Gunite Construction Co., Ltd. ...

H
Hamilton, A. H., & Co., Ltd. ...
Hardman & Holden, Ltd. ...
Harris & Pearson, Ltd. ... 98
Harrisons (London), Ltd. ... 145
Harvey, G. A., & Co. (London), Ltd. ...
Hattersley & Davidson Ltd., ...
Hick Hargreaves & Co., Ltd. ...
Hilmor, Ltd. ...
Hills (West Bromwich), Ltd. ...
Holmes, W. C., & Co., Ltd. ... 147
Honeywell-Brown, Ltd. ...
Horseley Bridge & Thomas Piggott, Ltd. ...
Horstmann Gear Co., Ltd. ...
Howden, James, & Co., Ltd. ...
Humphreys & Glasgow, Ltd. ... 102

I
Ideal Boilers & Radiators, Ltd. ... 91
I.C.I., Ltd. (Metals Division) ...
Inertol Co., Ltd. ...
Ingham, John, & Sons, Ltd. ...
International Combustion, Ltd. ...

J
Jeavons, E. E., & Co., Ltd. ... 100
Jeavons Engineering Co. ...
Jenkins, W. J., & Co., Ltd. ...
Jobling, James A., & Co., Ltd. ...

K
Keay, E. C. & J., Ltd. ...
Keith Blackman, Ltd. ... 148
King, Geo. W., Ltd. ...
King, Walter, Ltd. ... 145
Kings Patent Agency, Ltd. ...
Kirk & Co. (Tubes), Ltd. ...
Kirkham Hulett & Chandler, Ltd. ... 84

L
LaFarge Aluminous Cement Co., Ltd. ...
Laidlaw, R., & Son (Edin.), Ltd. ...
Lamont, James H., & Co., Ltd. ...
Lanarkshire Bolt & Rivet Co., Ltd. ...
Lancashire Dynamo & Crypto, Ltd. ...
Le Bas Tube Co., Ltd. ...
Lionweld, Ltd. ...
Lind, Peter, Ltd. ...

M
Macpherson, Donald, & Co., Ltd. ...
Magnetic Valve Co., Ltd. ...
Main, R. & A., Ltd. ...
Marco Conveyor & Engineering Co., Ltd. ... 83
Mavor & Coulson Ltd., ...
Meltham Silica Fire Brick Co., Ltd. ...
Mercol Products, Ltd. ...
Messenger & Sons, Ltd. ...
Metropolitan Leather Co., Ltd. ...
Milnes Meters, Ltd. ...
Mitcham Smelters, Ltd. ... 146
Mitchell, H., & Co. ... 98
Moler Products, Ltd. ... 98
Monitor Engineering & Oil Appliances, Ltd. ... 97
Monk, A., & Co., Ltd. ...
Morgan Crucible Co., Ltd. ... 82
Morris Commercial Cars, Ltd. ...

N
National Benzole Co., Ltd. ...
National Enamels, Ltd. ...
New Conveyor Co., Ltd. ...
Newton Chambers & Co., Ltd. ... 121
Norwest Construction & Co., Ltd. ...
Nu-Swift, Ltd. ... 145

O
Oakland Metal Co., Ltd. ...
Olding, Jack, & Co., Ltd. ...
Oxley Engineering Co., Ltd. ...

P
Parkinson & Cowan (Gas Meters), Ltd. ... 104
Parkinson Stove Co., Ltd. ...
Pass, E., & Co., Ltd. ... 78
Peckett & Sons, Ltd. ... 80
Peebles & Co., Ltd. ...
Pegson, Ltd. ...
Perl Controls, Ltd. ...
Plus Gas Co., Ltd. ...
Pollock & Peel, Ltd. ...
Power Gas Corporation, Ltd. ...

Pratt Engineering Co. ... PAGE
Press, William, & Son, Ltd. ... 94
Provincial Exhibitions ...
Pulsometer Engineering Co., Ltd. ...

R
R.T.S.C. Home Sales, Ltd. ...
Radiant Heating, Ltd. ...
Radiation, Ltd. ... 140, 141
Rawlplug Co., Ltd. ...
Reavell & Co., Ltd. ... 96
Remington Rand, Ltd. ...
Richmond Welding Co. ... 145
Riley, A. J., & Son, Ltd. ... 74
Roberts, R. E., & Sons, Ltd. ...
Robinson, J. H., & Co. (Liverpool), Ltd. ...
Royles, Ltd. ...
Royston, Geo., & Son, Ltd. ...
Russell Bros. (Walsall), Ltd. ...
Russell, R., & Sons, Ltd. ...

S
Salter, T. E., Ltd. ...
Saunders Valve Co., Ltd. ...
Scottish Non-Ferrous Tube Industries, Ltd. ... 92
Senior Economisers, Ltd. ...
Service Electric Co., Ltd. ...
Siebe Gorman & Co., Ltd. ...
Siemens-Schukert (Great Britain) Ltd. ...
Sigma Instrument Co., Ltd. ...
Simon-Carves, Ltd. ...
Simon, Richard, & Sons, Ltd. ...
Sisson, W., & Co., Ltd. ...
Smith Meters, Ltd. ...
Smith, Thos., & Sons (Rodley), Ltd. ...
Southalls (Birmingham), Ltd. ...
Spence, Peter, & Sons, Ltd. ... 72
Spencer Bonecourt, Ltd. ... 83
Sperryn & Co., Ltd. ...
Stanton Ironwork Co., Ltd. ...
Staveley Iron & Chemical Co., Ltd. ... 129
Steel Equipment Co., Ltd. ...
Stein, John G., & Co., Ltd. ...
Stelcon (Industrial Floors), Ltd. ...
Stewart & Gray, Ltd. ...
Stewarts & Lloyds, Ltd. ...
Stoves, Ltd. ...
Strachan & Henshaw, Ltd.... ...
Stringer Bros. ...
Sugg, Wm., & Co., Ltd. ...
Sutcliffe, Richards, Ltd., ... 118
Sutcliffe Speakman & Co., Ltd. ...
Sutherland, A. G., Ltd. ...

T
Thomas & Bishop, Ltd. ...
Thomas (Richard) & Baldwins, Ltd. ... 75
Thompson, John, Conveyor Co. ...
Thorp, Thomas, & Co., Ltd. ...
Tranter, W. J., Ltd.. ... 132
Tubela Engineering Co., Ltd. ... 95
Tucker Eyelet, Geo., Co., Ltd. ...
Tully, Sons & Co., Ltd. ...
Turners Asbestos Cement Co., Ltd. ...

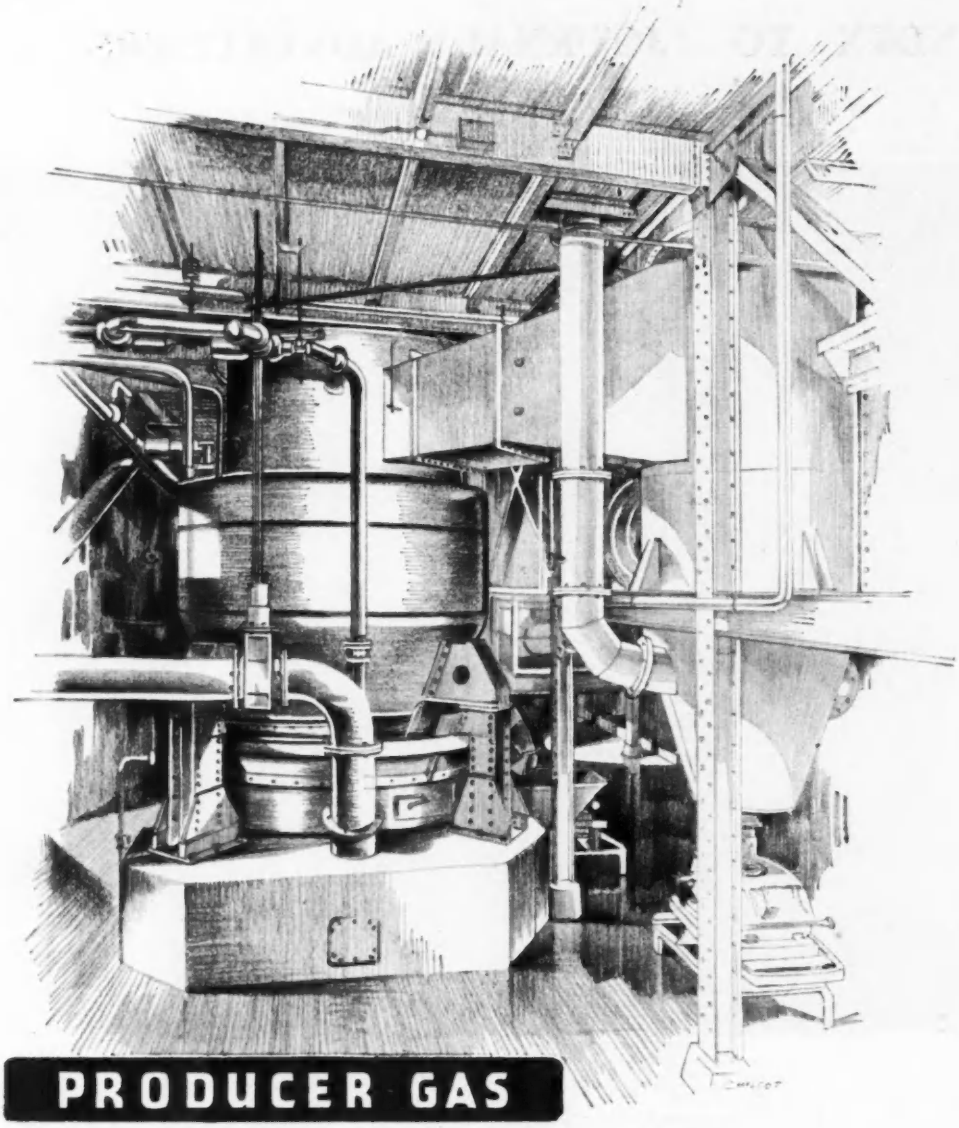
U
Underpressure Engineering Co., Ltd. ... 96
United Kingdom Construction & Engineering Co., Ltd. ...

V
Vale, Thomas, & Sons, Ltd. ...
Visco Engineering Co., Ltd. ...
Vulcan Stove Co., Ltd. ...

W
Wadsworth, Wm. & Sons Ltd., ... 127
Wadsworth, Wm. & Sons (S.A.) (Pty.) Ltd. ... 127
Wakefield, C. C., & Co., Ltd. ...
Wakelin, F. H., Ltd. ...
Walker, C. & W., Ltd. ... 136
Walker, Crosweller & Co., Ltd. ...
Waller, George, & Son, Ltd. ...
Ward, Thos. W., Ltd. ...
Warsop Power Tools, Ltd. ...
Weatherill, F. E., Ltd. ...
Wellington Tube Works, Ltd. ...
Wellman Smith Owen Engineering Corpn., Ltd.
West's Gas Improvement Co., Ltd. ... Cover III
West Hunwick Silica & Firebrick Co., Ltd.
West's Piling & Construction Co. ...
Westwood & Wrights, Ltd. ... 132
Whessoe, Ltd. ...
Wilkes, A. H., & Co., Ltd. ... 78
Willey & Co., Ltd. ...
Williams, John E., Ltd. ...
Williamson Cliff, Ltd. ...
Wilson, George, Gas Meters, Ltd. ... 86
Winn & Coales, Ltd. ...
Woodall-Duckham Construction Co., Ltd., Facing p. 116
Wood, Hugh, & Co., Ltd. ... 76
Wright, Alexander, & Co., Ltd. ...

Y
Yorkshire Copper Works, Ltd. ...

Appointment... ... 146
Appointments Vacant ...
Appointment Wanted ...
Contracts Open ...
Educational ...
Fellowship ...
Journals Wanted ... 145
Miscellaneous ... 145
Notice ...
Patents ...
Plant For Sale ... 145
Publications ...
Repairs ...



PRODUCER GAS

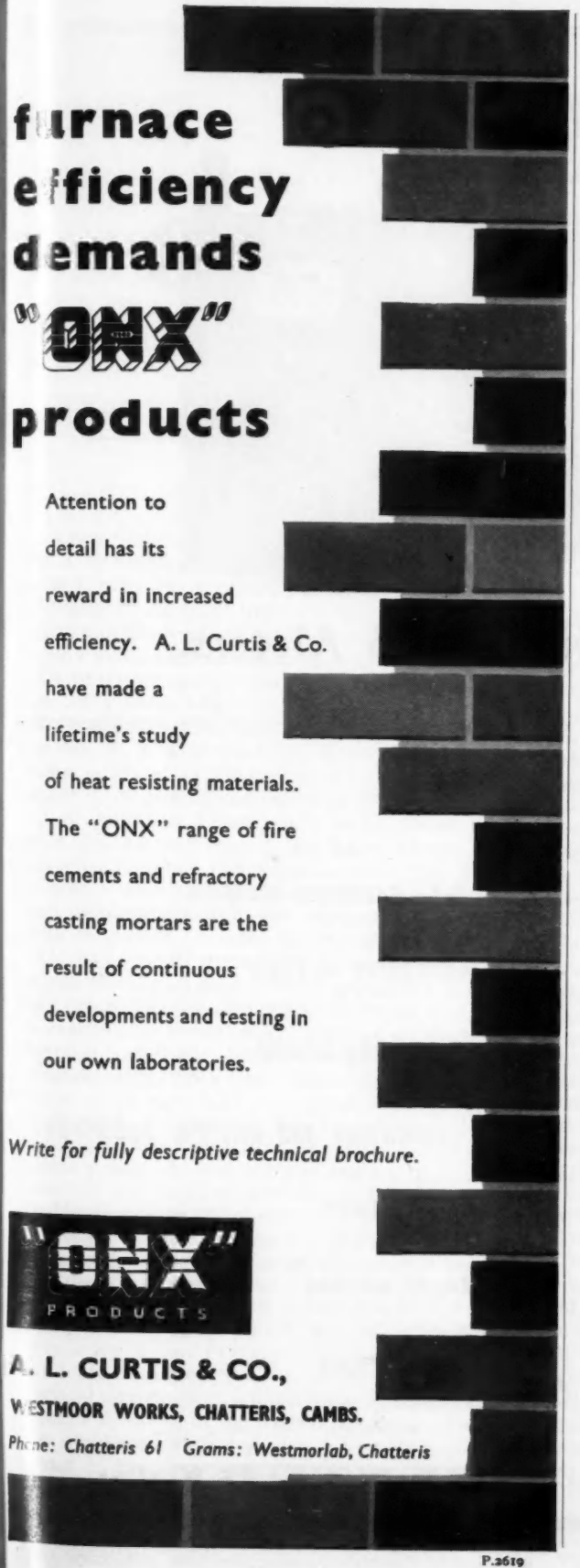
Humphreys-Glasgow Mechanical Producers supply hot gas for the Woodall Duckham Continuous Vertical Retort Installation at the new Swan Village Gas Works.

HUMPHREYS & GLASGOW LTD

HUMGLAS HOUSE · CARLISLE PLACE · LONDON · S.W.

Telephone Victoria 3961

ESTABLISHED 1892



P.2619

Gas Journal

105th YEAR OF PUBLICATION

EDITOR: NORMAN S. SMITH, B.Sc. (Gas Eng.)

11, BOLT COURT, FLEET ST., LONDON, E.C.4. Telephone: CENtral 2236-7 Telegrams: Gasking, Fleet.

VOL. 276 NO. 4715 October 14, 1953

CONTENTS

Page

EDITORIAL COMMENT
- Design for Production ... 105
- Operation Oxygen ... 106
- Advertising Morals ... 106

PERSONAL NOTES ... 108

OBITUARY ... 108

NEWS OF CURRENT EVENTS
- When Decontrol Comes ... 107
- Diary ... 108
- £4 Mill. Order ... 109
- National First Aid Champions ... 109
- South Western Section, I.G.E. Meeting: Mr. C. R. Ingham Succeeds Mr. J. W. Denton as Chairman ... 110
- A Great Day at Swan Village: Opening by Colonel Sir Harold Smith ... 111
- Society of British Gas Industries Golfing Circle: Autumn Meeting at Walton Heath ... 116
- Industrial Relations Conference to be held in the North West ... 143
- Midland Juniors Resume Activities ... 144
- Yorkshire Juniors' Annual Meeting ... 144
- Scottish Gas Board's New Projects ... 144

FEATURE ARTICLES
- Agricultural Use of Gas Liquor: Demonstration at Waterbeach R.A.F. Station ... 109
- New Gasworks at Swan Village ... 117

TECHNICAL RECORD
- Netherlands Gas Association. By G. E. Currier, O.B.E., Immediate Past President, Institution of Gas Engineers ... 107
- Gas Productivity Team: Report Discussed by North of England Section, I.G.E., and Northern Junior Gas Association ... 112
- Fuel Usage in Great Britain. Melchett Lecture by Dr. Harold Hartley, Chairman, Radiation Ltd. ... 133
- Creating Goodwill. Address to Yorkshire Junior Gas Association by J. G. Tilley, General Manager, Huddersfield-Halifax Group ... 142

Subscription Rates: Home and Empire 52/-; Foreign 60/.

Full Publishers' Notice: See Page 145.

Gas Journal . . . . Walter King Ltd.

THOMAS GLOVER
& CO. LTD., EDMONTON
LONDON, N.18 & BRANCHES

We also supply 1/- & 2/6 Meters.

Parkinson & Cowan Gas Meters

(A Division of Parkinson and Cowan Limited)

★ TERMINAL HOUSE, GROSVENOR GARDENS, LONDON, S.W.1.

- DOMESTIC METERS
- INDUSTRIAL METERS
- INFRA-RED DRIERS
- REMOTE INDICATION AND CONTROL EQUIPMENT
- STREET LAMPS
- LABORATORY METERS
- ROTARY METERS

★ THE HOME OF THE DOUBLE CENTURY METER

GAS JOURNAL

VOL. 276. No. 4715 105TH YEAR October 14, 1953

DESIGN FOR PRODUCTION

Another productivity report—*Design for Production*, by a British specialist team which visited the United States last year—published on Monday by the British Productivity Council (formerly the United Kingdom Section of the Anglo-American Council on Productivity) makes some useful contributions to the mounting collection of observations, findings, and recommendations of the many teams which have studied American production methods at first hand. The team was led jointly by Mr. R. S. Medlock, Chief Research and Development Engineer of George Kent, Ltd., and Mr. M. Hartland Thomas, Chief Industrial Officer of the Council of Industrial Design, and among the other nine members was Mr. Roy A. H. Scanes, Quality Supervisor of Evershed and Vignoles, Ltd. The terms of reference were 'to make a study in the engineering and allied industries of how design can be integrated with production to ensure the best utilisation of available materials and standard parts,' and the whole report emphasises the need for considering economy in production when deciding on design. Members of the team appear to have been as much impressed with similarities between British and American practice as by the best practice in the firms they visited, among which were some of the most highly developed and successful.

Research, for instance, has a strong appeal in the sober councils of American business. Expectation of future profits, the possibility of making rival products obsolete, and even its speculative element, are qualities that endear it to the American manufacturer. It is recognised as an investment for the future of the enterprise, and neither the capital, the material resources, nor the will to invest them is lacking. In spite of the prodigious output of the American educational system, nearly all the firms visited reported a shortage of science and engineering graduates, a shortage that had no doubt been brought about by the huge scale of the national defence effort. According to National Research Council estimates, of the 600,000 Americans of working age who have college degrees in science or engineering, about a quarter are engaged in research activities, equally divided between industry on the one hand, and university and Government employment on the other. The estimate for 1955 is an output of some 70,000 graduates in science and engineering, although it must be recognised that the standard of attainment for a bachelor's degree is not uniform between the different American colleges.

The team was mainly interested in the application of industrial research. Most research in the United States, including that carried out for universities and industries, is really what is normally called applied research, *i.e.*, it is directed to a specific object. American industry is very keen on research and 'a relatively large proportion of university research in the U.S. is directly endowed by industrial firms.' No one would seem to question the profitability of investment in research, although its publicity value was always taken into consideration. The research and development staff of a manufacturing firm has the function not only of carrying out practical investigations in its own laboratories, but also of keeping in touch with work carried on elsewhere. Research was planned carefully to fit in with industrial requirements and also with the eventual possibility of manufacture. Perhaps because of this approach American industry has often been able to apply the results of foreign countries' research more quickly than they have been applied in the countries themselves. This became possible largely because of the resources available and because of the high importance attached to research. 'In all the engineering departments visited,' says the report, 'there was a continual striving for standardisation and simplification. It was not considered that standardisation stifles progress, provided that the preparation of standards is frequently reviewed in the light of technological progress. Companies satisfy themselves that new designs are not just different, but better.'

The report has a great deal to say on the interlocking of design and production. The struggle for higher productivity has reached a pitch that demands specialists, to study and modify designs for the sole purpose of cheapening production. It was said to be too much to expect the average designer to be a specialist in both functional and production requirements to modern standards. To meet this situation, individuals, groups and departments constitute a link between the design and production departments and it is their responsibility to see that designs are easy to manufacture with the least cost commensurate with the desired quality. The report recommends that design policy should be clear and should be determined at the top level of man-

agement. The design policy when determined should be made known to all members of the organisation concerned in its application. More should be done by managements to explain company policy to the design and production departments at all levels. As a means of rapidly solving particular problems, the method of setting up 'ad hoc' groups of people from different departments should be more widely employed. The appointment of project engineers to supervise the transfer of a new design from research through engineering to production should be considered. Co-ordination between design and manufacturing engineering should begin, at the latest, at the design-draughting stage and should be well sustained right through to the production stage. More thought should be given to economy in scarce materials and the specification of alternatives by joint design and production engineering study. Opportunities for more industrial and academic training should be given to 'methods engineers' to equip them for co-ordinating work, but the improvement resulting from this action must not be impaired by permitting any decrease in the qualifications of design engineers.

OPERATION OXYGEN

Mr. G. E. H. Keillor is to be congratulated on what must still be looked upon as a very interesting experiment. The substitution of unadulterated oxygen for air in the revivification *in situ* of purified oxide seems to present some advantages. First it lends itself to strict control both as to proportion injected and in the position of its introduction. The fact that the oxygen is supplied under pressure eliminates the necessity for a separate pump and deprives the careless of an excuse for the obsolete 'method' of leaving a cock open somewhere to entrain air at the exhausters. Whether it was wise to couple the new method with benzole extraction is another matter, a controversy in which joined several contributors to the lively discussion that followed the presentation of the paper to the Scottish Association of Gas Managers, at their 92nd Annual Meeting (*Gas Journal*, September 30, p. 833). Indeed the whole question turns on whether the substitution of oxygen for air was not entirely justifiable without the addition of benzole extraction. True, benzole extraction is accompanied by a degree of reduction in organic sulphur content of the town gas but was this sufficient to remove effectually this defect in town gas?

All will agree that there might be a considerable economy in coal consumption if the oxygen were used without benzole extraction. And it cannot be doubted that at the prices of coal and coke prevailing at Airdrie, if the elimination of nitrogen were compensated for by an increased make of blue water gas in the retorts, increased steam, the smaller coke yield might make the method financially unsound. But we are not sure whether in practice this would be so. Mr. Keillor's costing assumes that all the coke made was readily sold; was it? Because this coal/coke ratio depends on a return for coke actually and readily realised. Mr. E. H. Jones even suggested that a reduced coke yield would narrow the present gap between the availability of coke and actual coke sales—some indication that such a gap does in fact exist. On the other hand, one would like to see worked out the implications of Mr. W. C. Campbell's suggestion that it might have been sufficient to re-declare the calorific value of the town gas at the higher figure naturally resulting from the reduction in it of nitrogen content.

In the long run there is, we suggest, no doubt that, while the production of benzole by the gas industry can make only a small contribution to the nation's requirements of liquid fuel, the coal cost of its major product, gas, is of increased importance and will be greater still in the years to come.

Quite a number of interesting questions were raised, many of them not for the first time, in the paper and in the very interesting discussion. Shall we go back to Mr. George Helps in loading town gas at the source with the inerts it must inevitably take up at the point of combustion? Is the tendency to use producer gas and even flue gas as diluents a step in that direction? Or shall we strive to reduce inert content so that we only distribute useful gases? There will be no question of the advantages of reducing sulphur. But as Mr. C. B. S. Mitchell put it, this idea of avoiding the introduction of nitrogen at the purifier boxes leaves us with the problem of the best thing to do with the resultant rise in calorific value. He went on to explore the possibilities of eliminating carbon dioxide as well. Technically, no fault could be found with the use of oxygen. It would seem that English coals with their high sulphur content requiring possibly twice as much air or oxygen for revivification in the purifiers as in Scotland offer correspondingly greater scope for savings, which might be made by the substitution of oxygen for air. Where, as Mr. James Dow pointed out, high priced coal could be saved by increased steaming, a marked financial advantage should accrue. We are informed that another works (in the South) is now experimenting with oxygen, and from this, as well as Airdrie's 1953 results, we shall expect news of interest in due course.

At any rate we can join whole-heartedly with Mr. D. Beavis in congratulating Mr. Keillor on putting his theories to the test. 'There have been too many theories in recent years and too few practical experiments.' He welcomed the paper 'even if he did not agree with the author's conclusions.'

ADVERTISING MORALS

The whole question of competition and competitive advertising by the nationalised fuel industries is fraught with difficulty. It is complicated by those who are opposed to competition of any kind and by those who, favouring competition in principle, have firm views on how it should be carried out. The question of whether a gas or electricity advertisement is good *as an advertisement* is seldom raised, except within the sound-proof walls of the industries themselves. For this reason the outspoken comments of 'Copytaster,' of the *Advertiser's Weekly* are of interest, since his review of current advertising layouts assesses them on purely professional points. In the September 24 issue he launched a violent attack on an E.D.A. advertisement—the one with the theme 'I'd never go back to old-fashioned cooking now.' Although we share 'Copytaster's' dislike of the advertisement, we are naturally not much concerned with improving the standard of electrical advertising. However, the article, which bears the title 'Making Faces in the Dark,' shows up the weakness of certain advertisers to score off their competitors 'even if their sly little nudges and digs mean nothing whatever to anyone else.' The offending line in the E.D.A. advertisement to which 'Copytaster' refers is 'You

can have flowers in the kitchen too.' 'Perhaps one reader in 50,' says 'Copytaster,' 'will realise that this is a reference to the popular notion that gas fires and cookers kill flowers, and the corollary that the "old-fashioned cooking" was by gas.' And he goes on to describe such a case as 'short-sighted and spiteful' and to do it in such a way that only the Gas Council and a handful of readers will understand it is a moonbeam from the larger luminary.' We could not agree more. It is as though a gas advertisement bore the headline 'No more nasty shocks in the kitchen' and then in smaller type, 'with gas-cooking the Sunday joint is never burned.' Fortunately neither the Gas Council (whose simple but powerful layouts must, we feel sure, meet with 'Copytaster's' approval) nor the area boards indulge in cheap cracks of that type. If they ever do, we shall be among the first to condemn them.

Netherlands Gas Association

By GEO. E. CURRIER, O.B.E.,

Immediate Past President, Institution of Gas Engineers

I WAS privileged to represent the Institution of Gas Engineers at the 78th general meeting of the Netherlands Gas Association, held in Rotterdam. Remembering the terrible destruction wrought by the German air attack on May 14, 1940, when about 25,000 dwellings were destroyed and many of the inhabitants killed or injured, I wondered how I should find this great city.

A statue commemorating this raid was unveiled a few weeks before my visit. I was told that the statue was the work of a Pole, living in Paris, who visited Rotterdam soon after the raid and was so shocked by the devastation that he exclaimed that it was just as though the heart of the city had been torn out. He conceived the idea of a permanent memorial in the form of a statue depicting a man with his heart torn out and completely resigned to his fate.

My first reaction was that here was a city rebuilding itself, not resigned to its fate, but with its heart pulsating strongly again. There are still open spaces in the city centre, but one could not fail to be impressed by the vast amount of work that had been completed, including imposing blocks of flats, broad thoroughfares and spacious squares, extensive commercial buildings and shops, all of excellent design and structure.

The meetings of the Association were held in the largest building in Western Europe, the famous Groothandelsgebouw (Wholesalers' Building), which has risen from the ruins. In addition to providing accommodation for meetings and exhibitions, this magnificent edifice with its shops and showrooms, banks and warehouses, restaurants and amusement facilities, is described as a sociable centre for business and recreation.

There was an atmosphere throughout the meeting of liveliness and enthusiasm. Among the papers presented and discussed were the following:—

'Natural Gas in America—Chemically and Physically,' by Dr. H. D. Tjeenk Willink, Deventer.

'Natural Gas in America—Distribution,' by Mr. H. G. van Veldhoven, Eindhoven.

'The Value of the Wobbe-Index as a Measure for Gas Quality in Relation to the Demands of Distribution and Consumption,' by Mr. A. van der Linden (Gasstichting).

'Cathodic Protection of a Gasholder,' by Mr. H. H. Ph. Backer, Leeuwarden.

Here I would pay tribute to my Dutch friends for their readiness to act as interpreters and in other ways help me to follow the proceedings.

A most enjoyable event was the dinner at the Hotel Atlanta in Rotterdam, where we were joined by the ladies, and representatives of the Fuel Ministry were present. The speeches were excellent, while the light entertainment provided a welcome diversion from the more serious business of the Conference.

An outstanding visit was that to the N. V. Bataafse Petroleum Maatschapij Oil Refinery at Pernis. I understand this is similar to the five large oil refineries which have been erected in our own country. The layout has been well planned and the works is a fine example of the best modern engineering practice. Most of the pipelines are overhead on trestles, some being laid in a shallow trench at the base of the trestles, so that each and every one is open for inspection at all times. The maintenance of the works is extremely good. The size of the plant is indicated by the fact that it is possible to store 70 mill. cu.ft. of oil in 1,000 steel tanks, most of which appear to be of riveted construction. The works is so vast that the supervisors are provided with motor scooters to enable them to carry out their duties. The plant deals with approximately 7 mill. tons of crude oil a year and the Rotterdam undertaking, together with four other gasworks in the province of South Holland, are taking a yearly quantity of refinery gas equivalent to 3,000 mill. cu.ft. of 450 B.Th.U. per cu.ft., and this can be considerably increased in the future.

I had the opportunity of inspecting the efficient and economical plant for dealing with bottled gas, also the plant for the large-scale production of pure sulphur. Another visit worthy of mention was that to the Rotterdam Docks, where there was intense activity. I was most interested to see there the plant used during the war for de-gaussing ships as a protection from magnetic mines.

I cannot conclude without making reference to the hearty welcome and most generous hospitality I received. No effort was spared to make my visit both interesting and enjoyable, and I shall certainly retain happy memories of the Netherlands annual meeting of 1953. I came away more than ever convinced of the lasting good that is bound to result from these meetings with representatives of the gas industry in other countries.

WHEN DECONTROL COMES

SPEAKING at a luncheon of the Coal Industry Society in London last week, Sir John Maud, Permanent Secretary to the Ministry of Fuel and Power, said that the problem of the coal industry was somehow to change the pattern of fuel use to match the new preciousness of large coal. People did not realise how short large coal was now and would be in the future. We could not over-emphasise the importance of installing better appliances, of improving the capital equipment both in factories and on the domestic front, if we were to succeed in adapting the country to the new facts of fuel life.

He did not know when solid fuel would be derestricted, but he was sure it would be the policy of every Government to derestrict as soon as possible. Were those in the coal industry ready with the sort of scheme which would be necessary in the new conditions that would prevail when decontrol came? Before control there was no such thing as the National Coal Board, and therefore there would be a series of new problems to which answers would have to be found, whereby supplies could be allocated without reference to any base line, without reference to the number of registrations, and in such a way that the enterprising and efficient merchant was able to extend his business.

Personal

MR. CECIL BARLOW, General Manager of George Orme & Co. (a branch of Meters, Ltd.) has been appointed to the Board of Meters, Ltd.

MR. G. A. VERNON, Sales Director of Cannon (G.A.) Ltd. has entered hospital to undergo an abdominal operation. He expects to return to work in about seven weeks time.

MR. OWEN R. GUARD, first Chairman of the Southern Gas Board and now a part-time member of that Board, has been appointed a Director of Minerals Separation, Ltd.

DR. A. A. WELLS has been appointed Chief Research Engineer and Head of the Engineering Research Station of the British Welding Research Association at Abington, Cambridge. MR. R. P. NEWMAN will be Chief Administrative Officer of the Station.

MR. E. C. THOMPSON, A.M.I.MECH.E., has been appointed Manager of the Domestic Instrument Division of the British Thermostat Co., Ltd., and is responsible for the production and sales of Teddington domestic gas controls. Mr. Thompson was, until recently, employed on the supply and administrative staff of the Frigidaire Division of General Motors, Ltd.

MR. F. J. MITCHELL, Manager of the Leighton Buzzard undertaking, has been appointed Manager of the Banbury and District undertaking of the Southern Gas Board in place of Mr. H. G. Broadbridge, who has been promoted. On behalf of his colleagues, Mr. H. Burdett presented Mr. Broadbridge with a pair of binoculars in recognition of his services. Mr. Broadbridge expressed his regret at leaving Banbury and said he hoped the co-operation and loyalty he had experienced there would be forthcoming for his successor.

MR. J. BELL, formerly station engineer of the South Western Gas Board at Brixham, was recently presented with a canteen of cutlery by Mr. J. W. Denton, Sub-Divisional Manager of the Torquay Sub-Division, the gift of his colleagues of the Board. As part of the integration of gas supplies in the South Western area, Mr. Bell has been appointed to the Cornwall Group, and will control the manufacturing section based at St. Austell. He went to Brixham from Bradford in 1939.

Obituary

MR. RICHARD W. BEDFORD, M.B.E., for many years Works Manager of the main factory of George Kent, Ltd., at Luton, died on October 3. A production engineer of the first order, Mr. Bedford joined Kents in June, 1904, and moved to Luton from London when the new works was opened in 1908. By shortly after the end of the 1914-18 war he had been appointed to assume the works managership. Perhaps his most outstanding achievement was the organisation of the firm's return to normal production after that war. More recently he had a great deal to do with the equipment and organisation of the new Kent factory at Resolven, South Wales, and was still actively engaged with the firm's affairs as Contracts Manager when he became seriously ill a few months ago.

MR. GEORGE KIBBLE, formerly assistant blast furnace manager with the Partington Steel & Iron Co., Ltd., Manchester, has died at Consett (Co. Durham) at the age of 72. He retired seven years ago.

MR. W. M. MASON, the first Secretary, and later Manager, of the British Commercial Gas Association, died at Port Patrick, Wigtownshire, on September 30, in his 83rd year. Older members of the industry will recall that after several years of very active service ill health caused Mr. Mason's retirement in 1932.

MR. S. H. HUNTER, who was Assistant Fittings Superintendent to the former Sheffield and District Gas Company, died on August 15. He was 77 years of age. Mr. Hunter commenced his career with the Gas Light and Coke Company, and became District Inspector. He was later appointed Chief Inspector with the Glasgow Corporation Gas Department in 1913. In 1928 he joined the Sheffield and District Gas Company, as Assistant Fittings Superintendent, where he remained until his retirement in 1948. He inaugurated the technical education of young gasworkers when he first joined the Sheffield Company. He taught practical and theoretical gas fitting at the Sheffield Technical College of Commerce and Technology. Even after his retirement his life-long interest in the gas industry was continued as he was a leading member of the Sheffield Gas Company's Superannuates Association and was recently Chairman.

Diary

Oct. 17.—MANCHESTER JUNIORS: Annual General Meeting; Presidential Address by J. Oates; Visit to Rochdale Gasworks.

Oct. 17.—WESTERN JUNIORS: Inspection of Basin Gasworks, Exeter, followed by meeting at Exeter Gas Showrooms, 'Some Observations on the Problem of Retort Leakage,' F. R. Rendle (Plymouth), 2 p.m.

Oct. 19.—WEST MIDLANDS G.C.C.: Dudley Room, Queen's Hotel, Birmingham. 2.15 p.m.

Oct. 20.—WALES AND MON. JUNIORS: 'Distribution,' T. L. Thwaite, and visit to British Nylon Spinners, Pontypool,

Oct. 22.—MIDLAND JUNIORS: Visit to Bryan Donkin Co., Ltd., Chesterfield.

Oct. 24.—WALES JUNIORS (NORTH): Inspection of Welded Gasholder and Housing Site, Llangefric.

Oct. 27-30.—Dairy Show, Olympia. Gas Council exhibit.

Oct. 27.—LONDON AND SOUTHERN SECTION, I.G.E.: Annual General meeting: 'An Accountant in the Gas Industry,' L. W. Smith; 17, Grosvenor Crescent, S.W.1, 2.40 p.m.

Oct. 27.—BRITISH ROAD TAR ASSOCIATION: Annual Meeting and Dinner, May Fair Hotel, London.

Oct. 28.—EASTERN JUNIORS: 'Education and Training' and 'Research' Sections of the Gas Industry Productivity Team Report on Visit to U.S.A.; Discussion to be opened by A. G. Higgins, Assistant Secretary, Institution of Gas Engineers, and Dr. A. Marsden, Area Scientist, S.W. Gas Board, Colchester.

Oct. 28.—BRITISH COKE RESEARCH ASSOCIATION and COKE OVEN MANAGERS' ASSOCIATION: Sixth Conference, Lecture Theatre, Royal Society of Arts, 2.30 p.m. 'Coke Formation, A Macro-Polymerisation Reaction,' Dr. H. L. Riley; 'Combustion and Reactivity of Carbon,' W. F. K. Wynne-Jones; 'Effect of the Physical and Chemical Properties of Coke on its Combustion,' Dr. R. A. Mott.

Oct. 29.—NORTH THAMES G.C.C.: Westminster City Hall, Charing Cross Road, 2.30 p.m.

Oct. 30.—LONDON JUNIORS: 'The Uses of Coal Tar and its Products,' J. R. Dewhurst, PH.D., South Eastern Gas Board; 178-180, Edgware Road, 6.30 p.m.

Oct. 30.—MANCHESTER AND DISTRICT SECTION, I.G.E.: Ordinary General Meeting, Gas Showrooms, Manchester, 2.30 p.m., preceded by luncheon at the Cafe Royal, 12.30 for 1 p.m. 'Opportunity,' J. Wilson, General Manager, Manchester Group, North Western Gas Board.

Oct. 30.—MIDLAND SECTION, I.G.E.: Autumn Meeting, Victoria Hall, Wolverhampton; 'Introduction of Electronics to the Gas Industry,' G. M. Rimmer, Electrical and Mechanical Engineer, West Midlands Gas Board; followed by luncheon and visit to Wolverhampton works of Electric Construction Co., Ltd.

Oct. 30-31.—YORKSHIRE JUNIORS: Jubilee Celebrations. Dinner, Hotel Metropole, Leeds, Oct. 30, 6.15 p.m. Visit to Rotherham, Oct. 31, 2.30 p.m.

Oct. 31.—SCOTTISH JUNIORS (WESTERN): Afternoon Visit to Dawsholm Gasworks, Glasgow.

Nov. 3.—EAST MIDLANDS G.C.C.: Victoria Station Hotel, Nottingham, 11.30 a.m.

Nov. 6.—SCOTTISH JUNIORS (WESTERN): 'Compressors, Boosters, and Governors,' B. W. Fowler, Bryan Donkin Co., Ltd., Royal Technical College, Glasgow.

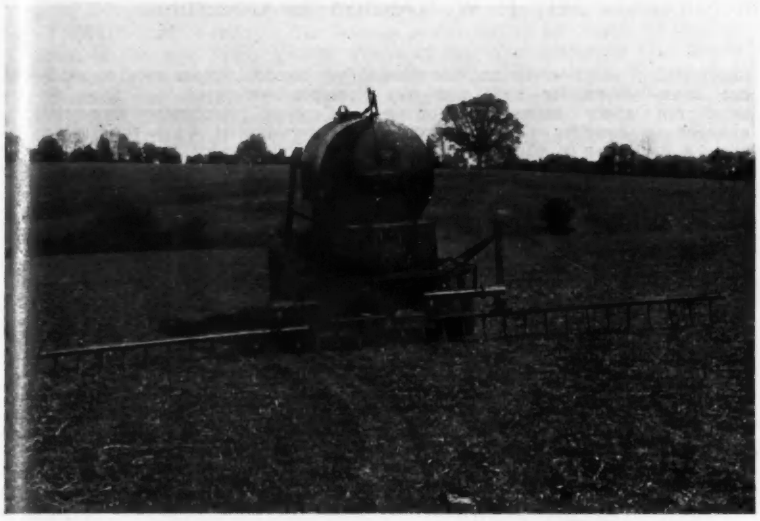
Nov. 7.—SCOTTISH JUNIORS (EASTERN): Visit to Howdon-on-Tyne Gasworks, Northern Gas Board.

Nov. 11.—MANCHESTER JUNIORS: Visits to Drakes, Ltd., and J. Morton, Ltd., Halifax.

Coventry is planning to save £10,000 a year by using sewage gas, now being wasted, to drive its sewage plant. The gas is methane—sludge gas—which now goes to waste at the Finham sewage works at a rate of 200,000 cu. ft. a day. Within two months it will be harnessed to produce electricity to drive the pumping engines at the plant, a job now done by diesel engines at a cost of £800 a month. The electricity produced will also be used to compress air for purifying liquid sewage, which has to be pumped into the river. Extra machinery has had to be fitted to convert the gas into electricity, but the gas itself costs nothing to produce.

Lecture to Master Plumbers.—The Scottish Gas Board has been co-operating with the Scottish Federation of Plumbers and Domestic Engineers (Employers) Association for some months. In pursuance of this policy, Mr. J. H. Gibbons, M.INST.GAS E., of R. & A. Main, Ltd., recently gave a lecture on Main gas appliances to master plumbers and their staffs at their chief showroom, George Street, Edinburgh. About 40 accepted the invitation and enjoyed an interesting and practical talk and full demonstration of the ease and speed with which a No. 20 'Century' cooker can be dismantled and reassembled.

Agricultural Use of Gas Liquor



Equipment for the Application of Ammoniacal Liquor

ON September 16 there was a demonstration at Waterbeach R.A.F. Station of the agricultural use of gas liquor. The demonstration was arranged with the co-operation of the Superintending Engineer, Mr. K. Apps and the Station Commander and was attended by representatives of the local branch of the National Farmers' Union, the Cambridge Agricultural Executive Committee, and the National Agricultural Advisory Service.

The equipment for the application of the liquor consists of a 500 gal. tank mounted on a trailer which feeds through a ball valve into a 50 gal. balance tank to ensure a constant head as the liquor is applied by gravity feed. The balance tank feeds through a 4 in. pipe into two 12 ft. folding booms which have ½ in. nozzles at 9 in. centres. Fixed to the nozzles are short rubber hoses which trail along the ground and minimise the loss of free ammonia to the atmosphere. The trailer with the tanks containing the liquor is drawn by a Fordson tractor, and as the liquor is gravity fed, the rate of application is controlled by the speed at which the tractor is driven. For this demonstration the application of liquor was carried out for the Eastern Gas Board by Messrs. T. T. Boughton & Sons, of Amersham, using their own equipment, but the Board has now constructed its own tanker unit which will be available for use next season in those parts of the Board's area where contractors' equipment is not available.

The liquor used was crude liquor from Cambridge gasworks and the analysis was as follows:—

Free ammonia as NH_3	1.33%
Fixed ammonia as NH_3	0.59%
Total ammonia as NH_3	1.92%
Cyanide as HCN ...	0.002%
Thiosulphate as S ...	0.14%
Sulphide as H_2S ...	0.17%
Thiocyanate as CNS ...	0.29%
Carbon dioxide as CO_2	2.07%
Chloride as HCl ...	1.00%
Phenols	0.66%

Two 10-acre plots were treated with applications of 400 and 200 gal. per acre respectively. In order to obtain comparative results, a further six control plots were treated with other fertilisers; two plots with sulphate of ammonia at 3 cwt. and 1½ cwt. per acre respectively, and two with a balanced fertiliser at 4 cwt. and 2 cwt. per acre respectively. The whole area was cut with gang mowers the previous day and on the day of application the weather was fine and sunny with a short heavy shower in the afternoon. This followed about 14 days of dry warm weather.

After application the characteristic striping due to the slight scorching effect of the liquor was immediately apparent. Experience has shown that this gradually fades and disappears completely in about three to four weeks.

The Eastern Gas Board has made several applications of crude liquor to grassland this season, all with beneficial results, the small quantities of toxic impurities present being quickly oxidised by the soil bacteria with no harmful effect on the grass. It has the advantage over solid nitrogenous fertilisers that it is immediately available to the plant and does not have to wait for rainfall before taking effect.

From the enquiries which have been made during the present season, it is anticipated that there will be a very much larger demand next year for the application of gas liquor to agricultural land in the Board's area.

£4 Mill. Order

THE Davy and United Engineering Co., Sheffield, has secured contracts worth £4 mill. for rolling-mill equipment to be installed in South Wales. The orders have been placed jointly by Richard Thomas and Baldwins, Ltd., and the Steel Company of Wales, Ltd., as the basis of a large-scale modernisation plan for the Welsh steel and tinplate industry. Some 12,000 tons of finished machinery will be supplied by the Davy and United Co. and its two subsidiaries—Duncan Stewart and Co., Glasgow, and the Davy and United Roll Foundry, Ltd., Middlesbrough—will also share in the contracts, most of which will be completed during 1955-6. The Steel Company of Wales has announced that, provided adequate labour is available, it proposes to restart four mills at its tinplate works at Pontardawe, and five at its works at Gorseinon, both near Swansea, on November 2.

NATIONAL FIRST AID CHAMPIONS

The Eastern Gas Board team, winners of the third annual Gas Industry National First Aid Competition held at the Conway Hall, London, on October 1. They now hold the Challenge Trophy, which was presented to them by Colonel Sir Harold Smith, K.B.E., D.L., Chairman of the Gas Council (fourth from left). In the group are Sir John Stephenson, C.B.E., Chairman of the Eastern Gas Board (eighth from left), Mr. F. T. Brookes, Divisional General Manager, Tottenham (third from left), and Mr. W. C. Squire (first on left) who coached the team. The team members are: Leonard S. Davis (captain), William H. Baker, Albert H. Mowles, John A. Whitmell and C. F. Worsdale (reserve).

South Western Section Meeting

Mr. C. R. Ingham Succeeds Mr. J. W. Denton as Chairman

THE annual general meeting of the South Western Section of the Institution of Gas Engineers was held in the South Western Gas Board's demonstration theatre at Radiant House, Bristol, on October 7, the retiring Chairman, Mr. J. W. Denton, presiding over the first part of the proceedings. Mr. Denton said he was pleased to welcome such a good gathering of members and was particularly pleased to see Mr. A. G. Higgins (Assistant Secretary of the Institution), Mr. E. R. V. Porter, Deputy Chairman of the South Western Board, and Mr. James Carr, Area General Manager, as well as divisional managers and other friends of the Section.

Mr. HIGGINS said his first duty was to convey to the Section the best wishes of the President and Secretary and their regrets that they were unable to attend the meeting. He thought the annual report was a record of a very fine year's work and many excellent technical papers had been presented.

He wished to pay tribute to the Section's education committee and mention the work of Mr. H. H. Brown (Exeter) and Mr. A. C. Rea (Bath). During the year to which the report referred the Section secured three out of four of the Institution's prizes and 30% of the successful examination candidates had come from the area. He was afraid that the changes of regulations of the Institution with regard to education would not have eased the Section's problems, but he was sure the decisions taken were the right ones and would enhance the Institution.

Mr. PORTER made a personal apology for the Board's Chairman, Mr. C. H. Chester, who was unable to attend owing to a meeting of the Gas Council.

New Members

Mr. R. G. Wakely (Exeter) and Mr. W. E. Bearshaw (Bristol) were elected new members and the resignation of Mr. G. P. Carter (Plymouth) following an appointment out of the area was reported.

The following members were elected to vacancies on the Education Committee: Mr. H. H. Brown (Exeter), Mr. O. H. W. Boonham (Bristol) and Dr. Arthur Marsden, M.B.E. (Bristol). Auditors, Mr. S. B. Jones and J. E. Wilkes were re-elected.

The CHAIRMAN proposed that in view of the good balance of the Section's finances the contribution of 20 guineas to the Institution Benevolent Fund be increased to 25 guineas and this was agreed.

The meeting unanimously adopted the third annual report, which recorded that during the year the Section welcomed 23 new entrants and that the total membership at the end of June stood at 143.

The CHAIRMAN said they could not pay too much attention to the inspiration of discussion and exchange of ideas so that there was sustained stimulation towards ever increasing improvements and efficiencies.

At the present time in the South West the Board was actively engaged in the integration of large works and the closing down of smaller units and they must not allow themselves for a moment to consider that this would allow a slackening of effort in technical matters. Conversely, they must realise that with larger units the need for the highest efficiency was vital. Every technical control must be carried out with a comprehensive knowledge and thoroughness which would maintain the high standards necessary for base load working.

They would need to consider less the fortuitous closing down of plant or starting up of plant to meet changing loads on the district. These diversions would not now occur, and in some respects they would take away from them the excuse that circumstances beyond their control had dictated their actions and resulted in subsequent loss of thermal efficiencies.

Ever Widening Facilities

They would need to adjust their outlook further ahead so that every advantage was taken of the ever widening facilities for attaining an economic balance of gas making and distribution.

The district presented very scattered groups of townships and hamlets and the problem of the Board, as he saw it. was one of factors—the diversity factor of distribution, the load factor on the gasholder, the distribution factor on high pressure supply mains and the compression factor. He was purposely omitting at this point any consideration of factors which might be applied in the determination of carbonising capacities of various manufacturing units.

They were economically expending capital on mains with the object thereby of saving money by manufacturing the gas at the more efficient stations. Great care had been given in the design of the linking network of mains to achieve balance between compression costs and capital costs. It remained now to utilise this system to its full advantage.

They could not do this unless a great deal of serious thought was given to the disposition of gas by the compressors to various holders. He did not propose to discuss any advantages that could be obtained by a good load factor on the outlet of the holder which could be attained by sales approach to build up load at non-peak hours.

The most immediate problem was to ensure that each holder was used to its full advantage. He freely admitted that if they could have disposed the holders geographically as they wished and to a designed capacity they could have made certain that each one would carry its fair share of the total load. The problem, however, was to deal with their existing storage and the distribution of gas to that storage in the most economical manner.

This certainly did not mean compressing gas to the capacity of existing compression plant and keeping the whole distribution network to such a pressure that every holder would have sufficient margin to eliminate the technical control necessary. By this means they certainly could reduce the cares of the person controlling the system, but conversely, they would increase very materially the compression costs.

Costs of compression were related to the pressure at which the gas left the works into the high pressure system. If they used their holder capacities wisely and balanced their distribution systems, it should be possible to work at considerably lower pressures than those necessary in a policy which happily aimed at keeping all the holders full and not taking advantage of their flexibility.

To illustrate the point he gave the following figures for a volume of 200,000 cu.ft. per hour:—

Pressure into grid system	H.P. required	Revenue cost of compression pence per therm
10 lb.	200	.21d.
15 lb.	280	.3d.
25 lb.	370	.4d.

He suggested that advantage could be taken in arranging their pumping schedules and intake to district holders so that savings represented by the figures could be attained.

They would have their problems, but if they realised what they were they could effect economies which would have far reaching results. He suggested that these problems were particular to each network so that consideration should be given in detail and at all levels. This called for an adjustment of outlook. Their existing methods of making gas to the day to day requirements of their consumers were no longer acceptable. New problems presented themselves to be resolved by engineers with imagination and enterprise. Each could contribute and he was confident that their Section would continue to support the Board by active consideration of all such problems in their industry.

Change of Secretary

He concluded by expressing regret that Mr. Holman Dunn, who had served as secretary and treasurer for so many years should have found it necessary to relinquish the position, but Mr. E. V. Dunn, who had for some months been assisting as Secretary, was allowing his name to be put forward as Secretary of the Section. Mr. Holman Dunn, he hoped, would maintain his deep interest in the Section in his capacity as Treasurer.

It was now his pleasure to hand over the chairmanship to Mr. C. R. Ingham and he was sure that under his guidance the Section would progress further.

Mr. INGHAM, on taking the chair, paid tribute to the work of Mr. Denton. It was with great pleasure that he presented him with a silver salver as a memento of his term of office.

Mr. Denton was then unanimously elected as the Section's representative on the Institution Council. Mr. F. W. Sansom (Exeter) and Mr. T. W. Jackson (Taunton) were elected to the Management Committee and Mr. E. V. Dunn was appointed Secretary.

The meeting closed following a talk by Mr. Denton on the underwater H.P. Feeder Main crossing the Westerschelde and a film depicting the progress of the project.

A Great Day at Swan Village

A LARGE part of today's *Gas Journal* is devoted to an illustrated description of the new Swan Village works of the West Midlands Gas Board. This project, commissioned by the Gas Committee of the Birmingham City Council and completed by the Birmingham Division of the Board, was most fittingly officially inaugurated by the Chairman of the Gas Council, Sir HAROLD SMITH, who, prior to the First World War, spent the greater part of his life in Birmingham and received his training as a gas engineer with the Birmingham Gas Department.

There is no need here to add much to our description on later pages. It has been possible, within the limitations and physical restrictions of the site at Swan Village, to install coal gas plant of 8.5 mill. cu.ft. per day capacity and, by installing a new 3 mill. cu.ft. per day water gas plant, to provide for a total production of 11.5 mill. cu.ft. per day. The layout of the plant is essentially modern and highly impressive, and the keynote, we suggest, is the superb cleanliness for a works of the kind and the wonderful amenities which the workers can enjoy. Visual inspection of the plant can give the right impression and the proper sense of perspective.

Last Friday was indeed a red-letter day for the West Midlands Gas Board and for its Chairman, Mr. G. le B. Diamond, C.B.E. It was a day of importance, too, for Mr. J. E. Wakeford, M.B.E., Divisional General Manager, Mr. G. C. Pearson, O.B.E., formerly Engineer-in-Chief to the Birmingham Gas Department, Mr. S. K. Hawthorn, Divisional Engineer, Mr. G. M. Rimmer, Electrical and Mechanical Engineer, and Mr. F. H. Cureton, Secretary.

Commemorative Plaque

The morning of October 9 was given over to inspection of the new works and the unveiling of a commemorative plaque by Sir Harold Smith. The company present was a very distinguished one, and we noted Mr. F. M. Birks, C.B.E., Deputy Chairman of the North Thames Gas Board; Sir Andrew Clow, K.S.I.E., C.I.E., Chairman of the Scottish Gas Board; Mr. G. E. Currier, O.B.E., Deputy Chairman of the North Eastern Gas Board; Mr. J. H. Dyde, Deputy Chairman of the Eastern Gas Board; Dr. R. S. Edwards, Chairman of the North Eastern Gas Board; Mr. J. T. Haynes, President of the Institution of Gas Engineers; Mr. H. F. H. Jones, M.B.E., Deputy Chairman of the Gas Council; Mr. Sydney Smith, Chairman of the East Midlands Gas Board; and Mr. S. E. Whitehead, O.B.E., Deputy Chairman of the Southern Gas Board. Naturally the local authorities neighbouring Swan Village were well represented.

Following the morning's tour of the works—all the more pleasurable because of the kindness of the weather—guests departed for Wolverhampton, where luncheon was served at Wulfram Hall.

The toast of 'The City of Birmingham' was proposed by Sir HAROLD SMITH. In the course of his remarks he said that for many years the City of Birmingham had justly enjoyed a world-wide reputation for sound local government and, unquestionably, the City owed a great debt to those men of courage and devotion whose efforts as pioneers initiated schemes of social welfare and the inauguration of municipal trading undertakings long before these became a generally accepted part of modern life. If he might speak personally for a moment, perhaps he could the more sincerely pay the same tribute, having spent the greater part of his life prior to the outbreak of war in 1914 in Birmingham and having received his training as a gas engineer with the City of Birmingham Gas Department. In fact, he suspected that he was asked to perform the inauguration ceremony that morning not solely by virtue of his present office, but also because the Chairman of the West Midlands Gas Board, Mr. George le B. Diamond, knew that he was appointed assistant engineer at that works in 1912, over 40 years ago.

History of the Undertaking

Something of the history of the Birmingham undertaking was related in the handsome brochure which had been prepared to commemorate this event, and perhaps it would not be out of place if he commented upon a few names mentioned in this brochure. The first name, obviously, was that of William Murdoch who, in 1802, to celebrate the peace of Amiens, gave an important fillip to his recently introduced system of lighting by illuminating the Soho foundry of Boulton and Watt; in fact, the Birmingham and South Staffordshire district might well be said to be the birthplace of the gas industry as they knew it today. Next, he must mention one who was perhaps Birmingham's most renowned citizen, Mr. Joseph Chamberlain, whose foresight led to the acquisition by the municipality in 1875 of the two gas companies which at that time served Birmingham and several neighbouring towns. Joseph Chamberlain met with a good deal of opposition in the Town Council when he proposed to buy the companies, and in response to a question 'Would you pay the price the Corporation is asked to give for these properties?,' replied 'I will undertake to give £20,000 a year for the privilege, and at the end of 40 years will retire with a snug little fortune of £200,000.' He became the first Chairman of the Gas Committee, and served in this capacity for five years, until an appointment in Mr. Gladstone's Cabinet led to his resignation from the office. He had been privileged to see a personal notebook which Mr. Chamberlain kept, and it was very illuminating to see the intimate knowledge he had of the affairs of the Gas Department. Joseph Chamberlain would not have been a loser financially if the Corporation had taken him at his word and had accepted his offer to give £20,000 a year for the privileged of supplying gas. Apart from handing over £2 mill. to the rates, until debarred by law in 1933, the Gas Department steadily progressed until its annual revenue exceeded £6 mill. Its outstanding indebtedness in 1949 when the gas industry was nationalised was less than half the annual revenue. While he remembered seeing and hearing Joseph Chamberlain once in his young days, he had no experience of him as Chairman of the Gas Committee, but he would like to recall someone whom he did know and who was personally known to many of them in this room and was greatly esteemed by all who knew him. He referred, of course, to John Henry Lloyd, who, for a period of 53 years was a member of the Gas Committee and was for 17 years its Chairman. He was well known throughout the gas industry on account of his membership of various national organisations. He was as highly esteemed as he was well known.

Tribute to the Corporation

Public men such as Joseph Chamberlain and John Henry Lloyd, needed the support of first-class officials in the execution of the policy which they decided upon. In this sphere also the City of Birmingham had been very fortunate. In the Gas Department names like Charles Hunt, Henry Hack, Robert Hilton, and Arthur Smith came to mind. These names would long be remembered in the history of the gas industry. Although he operated over a much wider territory than did any of his predecessors, the present Chairman of the West Midlands Gas Board, Mr. George le B. Diamond, was no mean successor to those he had mentioned.

He would like to pay tribute to the Corporation for its management which resulted in a first-class gas undertaking being handed over to the West Midlands Gas Board, and in particular to acknowledge the foresight of the Gas Committee and the City Council in planning the fine new works they had inspected that morning. Birmingham was never parochial in its outlook and in respect of its gas supply the statutory area of the Corporation was two-and-half times that of the City itself. The new works would not only serve parts of Birmingham, but also form an important key point in the integration of South Staffordshire undertakings and would, if the Board's plans were brought to fruition, be a further step towards shutting down obsolete plant and towards ensuring more economic supplies.

He coupled with the toast the name of Alderman George Griffiths, Lord Mayor of the City.

The LORD MAYOR OF BIRMINGHAM, in response, suggested that the Swan Village gasworks could properly be regarded as among the finest in Europe.

The other toast was that of 'The West Midlands Gas Board,' proposed by Mr. C. A. F. HASTILOW, O.B.E., President of the Birmingham Chamber of Commerce, who characterised the gas industry as one of the nationalised industries which was indeed a great success. He referred also to Mr. Diamond's wide human understanding.

Response was made by Mr. G. le B. DIAMOND, C.B.E., who spoke of the help they had had in solving their effluent problem from the West Bromwich authorities and also from Walsall. He spoke in praise, too, of the work of Mr. Alex Lee, Deputy Chairman of the West Midlands Gas Board, and of Messrs. Pearson, Hawthorn, and Rimmer. Increased efficiency at the new works had resulted in a great saving in coal consumption. Unfortunately, this saving had been swamped by increased coal prices.

GAS PRODUCTIVITY TEAM

Report discussed at a joint meeting of the North of England Section of the Institution of Gas Engineers and the Northern Junior Gas Association, Newcastle, October 1, 1953

THE Report of the British Gas Industry Productivity Team which visited America in 1952 was discussed at a joint meeting of the North of England Section of the Institution of Gas Engineers and the Northern Junior Gas Association in the Northern Gas Board Assembly Hall, Market Street, Newcastle, on October 1.

Opening the meeting, Mr. C. W. PERKS (Chairman of the North of England Section of the I.G.E.) who presided, paid tribute to the members of the Productivity Team. Their report, he said, revealed the tremendous scope of their investigations and the amount of hard work they put in while in the United States. They were to be complimented on the clear and concise way in which their findings had been presented.

Acknowledging Mr. Perks's welcome, Mr. D. J. COLVIN (Controller, South East Division, Scottish Gas Board, a member of the Team) said that he and his colleagues certainly found that their time was pretty fully occupied while in America but it had been a most interesting visit and they had learned a lot.

Mr. E. Crowther, C.B.E., (Chairman, Northern Gas Board), opening the discussion, said he thought it was agreed by all that this report was a first-class piece of work, reflecting a great deal of credit on the team. They had put a lot of work into this job, and none of it had been wasted. They had presented a very complete factual record of many features of the gas industry in America. They set out what they saw, but there was nothing school-masterish about the report. They did not say what they thought should be done in this country, but left the readers to draw their own conclusions. That was extremely wise. Since they had not told others what to do, would it be fair play to ask them just what they were doing themselves—what was being done in the boards they represented—as a direct result of their experience in compiling this report and getting the information that led up to it?

A Lesson for All

The impression one got from reading the report, and it was a lesson for all, was that the Americans were not afraid of spending money on capital equipment of any kind, or of replacing obsolete capital equipment. And when they had spent that money, they made quite sure that the equipment worked. When they built a water gas plant, it probably did not cost a great deal more than one of comparable size in this country but they made it turn out twice as much gas. That was most interesting, and he had been disappointed that some plant manufacturers in this country appeared to have been slow to tap the underlying ideas that had enabled these plants over there to produce a very big output in comparison with the capital value. The same remark applied to pipelines. The Americans spent tremendous sums of money on pipelines, and they made these lines work. It was quite evident that they had gone out of their way to keep them running at capacity for as near 24 hours a day 365 days a year as they could contrive it. How, they must ask themselves, could they in this country make a capital investment earn a bigger return than it did? This packing of the line, for example, for storage, seemed an excellent idea. Of course, they had to have distribution systems that would stand up to it. The Americans had such systems, and they made them work.

Perhaps one of the most interesting outcomes of the report up to date was the pending investigation into the possibility whether natural gas could be found here, and, as a corollary, of natural gas in this country. They were going to see whether underground storage of gas in really large quantities was capable of being practised here. If the answer was 'yes,' it was going to make a lot of difference to their economy.

Some of the tariffs quoted in the report were in therms, so it was to be assumed that in America they did in fact use the therm as a basis of charge in at least some of the undertakings. What kind of statutory control, or its equivalent, was applied in the matter of calorific value? Was there some testing comparable with what existed in this country to see that calorific value was observed?

Another big question that was in prospect in this country was concerned with the interchangeability of gas. In America, one gathered from the report, an undertaking might send out some very diverse types of gas—natural gas at one time; at others, mixtures of varying kinds. Yet the burners of the consumers' apparatus must continue to function satisfactorily, no matter how the changes were rung on the different kinds of gas. Were calorific values shifted deliberately when there was a change of composition?

It was rather surprising, perhaps, to anyone in this country to read the statement that pay incentives were little used in most of the operations of the workers in the American gas industry. He would like to know what was the underlying reasoning that had led the American gas industry to avoid the use of incentive payments.

Integration in the Eastern Area

Mr. J. H. Dyde (Deputy Chairman, Eastern Gas Board), who was Leader of the Productivity Team, replying, said that in regard to high pressure distribution, they made it quite clear in their report that it could be developed in this country only on a limited scale, with nothing like the pressures they found in America, because, after all, geography was a limiting factor. It could be developed if sources of natural gas were found.

Referring to the idea of carbonising coal nearer the collieries, or at strategic points where the coal could be brought at very low costs, he said the Eastern Gas Board had been looking into the possibilities of supplies from the Midlands. The availability of such supplies at the present moment seemed to have receded, but they still felt there might be a possibility of supplies coming from the Midlands direction, so that in planning their integration scheme, or sections of it, they had borne that in mind. Recently his Board had passed a scheme linking Peterborough in the north through other towns down to Cambridge and extending out to the west. The mains would be 12-in. diameter steel and they would test to at least 150 to 200 lb. pressure. Mains on the side branches would be of smaller diameter, but would again be of steel. They would be suitably protected, on the lines indicated in the American report, by cathodic protection. On another section they had a number of small village-towns whose potential expansion as agricultural market towns was not great. They were connecting them up across some 10 to 14 miles or thereabouts with 2½-in. and 2-in. steel tubing. They felt that there was a very great deal to be gained, certainly in the application of cathodic protection to steel distribution systems

Owing largely to the sulphur-free gas arising from natural sources in America, there was great freedom over there to use steel equipment or appliances. Why were they taking so long in this country about removing sulphur? Why were they doing practically nothing about it? It was true that some undertakings had gone ahead on this matter, but, generally speaking, since the war no very great steps had been taken. Post-war conditions probably accounted for some of the hold-up. As more steel became available, he thought they could get to the point at which they really must deal with the sulphur problem. The Eastern Gas Board was considering an inquiry aimed at getting some information as to the reduction in maintenance costs and the possibility of increased business from the utilisation of flueless appliances.

Selection of Coal

Another object they were trying to achieve was to divert coals allocated to them to the plants where they felt they would give the best results. In their report the Productivity Team made a point of selection of coal for the right carbonising plant, but it was much more difficult in this country than in the United States. The members of the team could almost have wept when they saw the constancy and uniformity of the coal going to the plants, and the effects. It was a difficult problem in this country, and a very difficult one for individual boards to tackle. There would have to be some give-and-take before they got down to greater selection of coal for carbonising plants.

It was felt that in view of the shortage of coal they had to make gas from other agencies. One of the potentialities in that respect was the oil industry. On the last three water gas sets the Eastern Board had put in, they had fitted them so that heavy oil could be utilised. The question of the setting up of propane or butane storage tanks was being looked into.

In reply to Mr. Crowther's question on the control of calorific values in America, Mr. Dyde said that calorific

value and pressure were controlled and tested by each State Public Service Commission. He did not think that there were the same penalties associated with variations in calorific value as in this country. Neither were there the same penalties associated with the distribution of sulphur in the gas. Some States did impose maximum limits on sulphur, generally 10 grains total sulphur per 100 cu.ft.

In the matter of the interchangeability of gas, the Americans studied the mixtures of these gases very carefully and they had some fine equipment for determining the limits to which they could go in varying the different types of gas which were available to them.

Productivity in the Meter Shop

Mr. **J. E. White** (General Manager, Newcastle Division, Northern Gas Board) said that in the report reference was made to meter repairs, and a case was quoted where in a meter repair shop visited, which had seemingly been subject to a fair amount of mechanisation, the output was 10,000 meters annually from 10 men, or 1,000 meters per man-year. By an odd coincidence the output of the meter repair shop contained in the building in which they were meeting that day was 13,000 meters per annum from 13 men, or exactly the same number of meters per man year. The Newcastle figure was based upon 50 weeks per annum, less the usual local and bank holidays, and a week of 44 hours. While the number of meters repaired per man was the same, there was one very significant difference. Of the 13,000 meters repaired in Newcastle, 11,000 were prepayment, while no doubt all those repaired in the American shops would be ordinary. Their experience in Newcastle was that the time required to repair an ordinary meter was but 75% of that required to repair a prepayment meter, and it was thus seen that the productivity per man engaged in Newcastle was 25% above that of his American counterpart, even though mechanisation had not been taken to seemingly anything like the same degree.

It was stated in the report that the average cost of a repair amounted to 5 dollars, and one was disposed to enquire what rate of exchange was applied to the dollar. It was perhaps sufficient to say that in the Newcastle shops the cost of labour and material over all meters repaired during the past 12 months was 21s. for an automatic meter, and 16s. 4d. for an ordinary.

He noted with interest reference to the use of induction heating for the unsoldering of meter tops, and that the time required by this method was from 25 to 30 secs. In the Newcastle shops the time required was 1 min. to remove the paint, and for all practical purposes 1 min. to unsolder the top. He would be glad to know what happened to the paint when induction heating was used. Had it been previously removed, and if so, was there any record of how long the process required? The reason for the question was that he was tempted to think that unless very careful prior paint removal took place, considerable difficulty would be experienced with induction heating.

He was much intrigued to note in the report a meter installation where a battery of industrial meters had been fixed in parallel with a common inlet and outlet. In the days when very large industrial meters were not available, this practice was attempted on Tyneside, with uniformly unsatisfactory results. It was their experience that one meter took the load, while another idled, with obvious results.

He noted references to internal supplies, where it was stated: 'Services and meters appear to be installed by gas companies, and internal pipe work by installing agencies, who may be plumbers or contractors.' It was at this point where the British and American conception of service to the consumer parted company, and he would like to suggest that it was an issue to which the gas industry in this country should give very careful consideration at the present moment, when a great deal of thought was being given to the subject of dealer co-operation.

Dealer Co-operation

He was intrigued by the comment relating to 'Maintenance of Appliances': 'If parts are found to be defective or to require replacement, the consumer is advised to contact the dealer who supplied the appliance and arrange for the necessary work to be carried out.' The tradition of individual service to the consumer by the gas industry was so firmly established in Britain that one had no difficulty in imagining the consumer's reaction if, having purchased an appliance from a dealer co-operator, the consumer called at the showrooms for a replacement, and was referred back to the dealer from whom she purchased the appliance. One could visualise the letter to the chairman of the board, the local Member of Parliament, and the Minister of Fuel and Power himself, which would inevitably follow. This problem must not be lightly glossed over, as was rather the present tendency by those in favour of all-out dealer co-operation. He submitted that if a consumer purchased a gas appliance, she had the right to expect 'after sales service' from someone, and that unless dealer co-operators were prepared to establish records and service facilities independently, but working in conjunction with the local gas undertaking, nothing but dissatisfaction to the consumer, and consequent harm to the industry, could result.

First and foremost a dealer co-operator must be 'our man,' as willing to take and transmit to the gas board a message concerning a penny stuck in a slot meter as to sell a de luxe cooker. This, in a very small way, was the system which was operating in the Newcastle District, and which had so far given reasonable satisfaction and success, on what must be emphasised was a very small scale operation.

On a recent day he had a survey taken of what transpired at the service counter and on the service telephones of the principal showroom of his Division. Six hundred consumers had cause to contact that particular showroom. Of these 600, 66 were by telephone, 83 were concerned with either meters that were full or had coins fast, 141 were in respect of cookers requiring service in one form or another, 73 for fires, 40 for water heaters, and 66 in respect of other appliances. There were 37 exchanges of tenants, 66 escapes, 22 enquiries which were either handled by service personnel or redirected to sales staff, and the balance of 72 was passed to other departments, primarily in connection with either gas accounts or hire-purchase transactions.

That conception of service must be maintained, since it was probably the greatest single contribution to consumer goodwill that the industry possessed.

Whole-House Heating

He was interested to note reference to whole-house heating, of which he had had some personal experience in the States. One important feature existed there which had not yet taken root in this country. It was American practice to regard the installation of whole-house heating in a new house in very much the same way that water and electric services were regarded in this country—as simply an essential service incorporated in the general scheme of things. Consequently in America the cost of the whole-house heating unit was included in the purchase price of the house, and therefore ranked for inclusion in the mortgage. He would like to suggest that this system might well be noted by British building societies, who at the present moment would cover the structure of the house, but for some reason or other excluded any form of heating or cooking arrangements beyond the traditional coal fire or kitchen range.

Having seen the operation of whole-house heating at first hand, he wondered precisely what would happen to British gas storage facilities were it to be largely adopted in this country, with at the same time a substantial importation of the so-called 'American way of life.'

He noted reference to the seemingly very high sum quoted as arising from damage to appliances, and ventured to suggest that *pro rata* the figures were probably on the same scale in this country. It seemed to him that the only ways of overcoming this problem were the use of special vehicles for the delivery of appliances based upon low loading heights, and thereby avoiding the lifting of appliances from unsuitable heights to road level, where most of the damage was done, and the introduction of an incentive bonus, which made it advantageous to the men delivering the appliances to ensure that they arrived in perfect condition.

He noted the reference in the report to the effect that no incentive bonuses existed for contractors or utilities workmen engaged on mains work. Mains gangs operating in the Newcastle Division were now working on an incentive bonus.

Further, it was stated that, with few exceptions, notably salesmen, no payment by results schemes were encountered in America. It would be extremely interesting to know how in a country famous for incentive bonuses and highly-geared piecework schemes, with their attendant high incomes, the gas industry managed to attract and hold labour in the face of competition from other industries where the means to earn large wage packets were so extensively employed.

Farming-out Installation Work

Mr. Colvin said that, in regard to the unsoldering of meter tops, the paint was stripped off in a bath before the use of induction heating. As for internal supplies, all the installing in America was done by outside agencies; he could remember only one exception, in Philadelphia. There they fixed part of their appliances and said they would like to fix more because they were not too happy about dealer co-operation. But in the bulk of the country the reverse opinion seemed to hold good and they were only too anxious to farm the whole of the installing work out to the dealers. They believed that the gas industry existed primarily for the production of

gas, and that if they did otherwise they would be taking the living out of other people's mouths. Like fixing, the maintenance of appliances was in the hands of the dealers; that was practically universal. The gas companies would deal with normal repair work not affecting appliances—they adjusted all whole-house heating installations (quite a large number of them had a service for a fixed sum per annum for whole-house heating installations, putting them into action at the beginning of the season and turning them off at the conclusion). Apart from that, there was little servicing as such.

A Fundamental Issue

Mr. Dyde said that this was a fundamental issue. In this country they had built up a tradition of service. They had built it up entirely on their own and it had had to stand or fall on its merits. In America things were entirely different. There they had a tremendous sale of appliances; it was very, very big business indeed. In Britain they felt that they had built up through the union organisation a good quality of craftsmen, and they had a high standard of full maintenance service. They did not feel that they should in any way recommend a change there, but they did feel that, so far as the initiation of business was concerned, they had many dealers selling products and producing goodwill for gas. There was no reason why the dealers should not be brought into business, or the selling end of it. As for America, such maintenance as was done by the gas industry—and it was an emergency service—was done extremely efficiently.

Mr. G. E. Haddon (Distribution Engineer, Stockton Division, Northern Gas Board) addressed a series of questions to Mr. W. H. B. Porter, Distribution Engineer, North Western Gas Board, a member of the Productivity Team. They were:

(1) Would he comment on the practice of this country using, and favouring, cast iron for most mainlaying work, and the apparent preference of the United States for steel?
(2) Would he give his opinion of the extended use of cathodic protection in this country to (a) existing mains, and (b) future mainlaying, and to what extent would it apply to cast iron and steel?
(3) Would he favour, for service in this country, the abandonment of screwed pipe-laying practice, and the adoption of the U.S. technique of plain ended pipes and gland and/or compression type couplings?
(4) Following on the U.S. practice of high working pressures of hundreds of pounds per square inch, would he comment on hazards involved to (a) the gas operatives, and (b) the public?
(5) Had steel service pipes in the U.S. a longer or shorter life than was experienced in the U.K. and how was the problem of the internal corrosion of services dealt with?
(6) Would he favour for the U.K. the U.S. practice of fitting kerb cocks to all services?

Mr. Porter, in his reply, said it was not true to say that the Americans favoured steel. The fact was that they went in for steel largely owing to the trend towards higher pressures. Certain pipes were in cast iron. The use of cathodic protection was certainly growing in this country, and it was being applied to cast iron and steel mains. The North Western Board had actually started to use this on a holder tank. In his area they were moving away from the screwed joints towards the compression joint. In America techniques had been developed to militate against hazards involved in the practice of high working pressures. The fact was that insurance payments started to rise, and it was probably this that led to the introduction of leakage surveys, which were standard practice there. The Americans, generally speaking, did not have the same internal corrosion problems as existed here. Where they had cathodic protection they were all very sanguine about the life of steel service pipes not being less than 60 years. The development of anti-corrosion in the United States had assumed major proportions. Nearly every utility had corrosion engineers on its staff. He would not recommend kerb cocks otherwise than as recommended by the Institution of Gas Engineers. Kerb cocks in the United States were developed for special reasons. Fire departments almost insisted on them.

National Fuel Policy

Mr. F. H. Fryer (Darlington) said that the outstanding impression he had from the report was that it emphasised what to his mind should be the future trend of national fuel policy in this country—control of all fuels by a body constituted in a similar manner to that existing in the gas industry, with a National Fuel Council and Area Fuel Boards, thus promoting fuel conservation by ensuring the economic application of either type of fuel to the various needs of the nation, and incidentally giving administrative economy, together with a greater degree of control of atmospheric pollution. He thought the fact that in Britain they had achieved an increase in sales of 100% against rising costs of manufacture of the order of 50% made quite a favourable comparison with what had been done in America.

He would have liked to see a comparative table showing the development and growth of both gas and electricity in America. They were accustomed to use this yardstick of measurement of their progress in this country. In the case of the combination utilities, the advantages of having staff available and competent to deal with sales, consumer service, secretarial, legal, public relations, and consumer meter reading and accounting for both gas and electricity services was apparent from the economy of staff achieved, stated to be of the order of 45%.

He would like to hear the views of the Team members on the system of appliance sales, installation, and servicing being carried out by organisations outside the industry, as compared with the almost total control of these activities from within as in Britain. While they considered it gave them the advantage of complete control, consumer satisfaction, and promoted increased sales, they must remember that both the electrical and water industries in Britain operated under conditions similar to those in U.S.A. and appeared satisfied.

He was interested in the composition, properties, and characteristics of natural gas. Some two years ago an American firm, with Government assistance, established themselves at a local trading estate. They were engaged in the production of barium filaments for valves used in radar equipment. The metal was placed in a small retort and heat was applied to reduce the metal to working conditions. His Board was asked to supply heat to the retort by gas, which had to have a C.V. of 1,000 B.Th.U. as used in the United States. After investigation they put in standard burner equipment, operating on gas-air blast, and were agreeably surprised when the American proprietor informed them that the heating system produced better and quicker results than he was accustomed to obtain in America, using natural gas.

In the field of gas compression and long distance transmission the American gas industry was undoubtedly pre-eminent, but he would have appreciated further reference in the report to the hazards involved in this work, particularly on repair and extension work where obviously there must be considerable risks involved, and the safety precautions enforced and practised.

The development in the production and distribution of liquid petroleum gas mentioned in the report was opportune. He believed there was a case for its extended use in this country where ageing production plant, distribution mains system, meters, etc., did not allow of best results from modern gas appliances; in addition to which, the prohibitive cost of their replacement and maintenance created an uneconomic and unremunerative position. He thought they would have to be more closely concerned with liquid petroleum gas in the future.

Bottled Gas

He would have thought that the Gas Council would have considered the purchase and take-over of the existing bottled gas industry operating in this country and developed this load to its full potential. The report mentioned the increasing use made in America of this gas on farms as motor fuel for tractors and motor vehicles fitted with suitable gas carburation equipment. In the domestic field, the fact that the use of bottled gas had the additional advantage of dispensing with distribution mains, meters, etc., made its application worth serious consideration.

The American practice in regard to interruptible supplies brought into prominence the attitude in Britain in restricting the business of central heating and other large-scale loads. Could they not—protecting themselves by suitable agreement, and, after having in conjunction with central heating boiler manufacturers agreed on a boiler design having reasonable conversion efficiency, using town gas, coke, or liquid petroleum gas—obtain this business for gas on an interruptible supply basis, thereby increasing their business together with consumer goodwill?

He still believed that it was better to use transmission pressures within the range of spun cast iron pipe with mechanical joints and to use this pipe in preference to steel where possible. Some 15 years experience of this form of main, laid in mining areas liable to subsidence, proved that it possessed the mechanical strength and greater resistance to soil corrosion to justify its use on economic grounds. Although cathodic protection appeared to have great possibilities, some doubt still existed as to whether it afforded complete protection. Recently in his area they had had the General Post Office applying this protection to the lead covering of underground cable. They installed an electricity mains transformer in the telephone exchange, connected the negative terminal to the cable sheath, and the positive to a sacrificial earth comprising mild steel rail buried near the exchange. The current used was 0.5 amp, at a pressure of 22 volts, voltage

being variable. The voltage was adjusted to the minimum required to maintain a negative potential in the cable sheathing of this installation, this minimum being carefully controlled to avoid undue wastage of the sacrificial earth.

Records showed that this protection was proving effective in protecting the cable sheath. They naturally were concerned to ascertain what effect this protection had upon their adjacent gas mains. Tests were made upon the mains and it was proved that these mains retained a negative bias to the surrounding earth with the cathodic protection to the cable on or off, the amount of bias varying only in degree. This variation, in the P.O. engineering opinion, was attributable to the soil characteristics and composition surrounding the cable duct. Naturally they would keep close observation and test on these mains, and it was perhaps reassuring that they were of cast iron construction. But it raised the point that should all utilities having buried metal construction apply this form of protection, they might cause trouble for each other by the effect of its application. In the light of experience in this country it was doubtful whether the costly leakage surveys undertaken in the United States would justify their cost here, although worth while on the principle that prevention was better than cure and the effect on the reduction of unaccounted-for gas.

No Prepayment Meters in the U.S.

He was interested to learn of the exclusive use in America of the credit or ordinary meter, as having the advantage of reducing capital cost and accelerating the rate of meter reading and eliminating theft. But there still remained the question of collecting the accounts, the difficulty of the consumer reluctant to pay, and bad debts.

He believed the only satisfactory answer to ensuring continuous accurate meter registration under existing conditions was to exchange either on age or on consumption recorded, as in America. It was difficult to suggest any other satisfactory solution as the varying gas compositions, presence of gum, and other injurious properties in the gas, made standard performance difficult. However, the adoption of a standard accelerated life test, of say 20 years, would at least clear up some of the mechanical faults still encountered.

The greatest value of the report lay in its reference to industrial relations policies. Despite the efforts of the joint consultative committees, he still doubted whether they in this country had replaced the team spirit existing in the industry prior to nationalisation. As the report suggested, the adoption of the right policy here could have a considerable effect upon the worker's attitude to his job. In some people's opinion, one of the factors retarding increased production was the lack of effective personal leadership in industry, at both management and supervisory level, and they suggested that good leadership built up team spirit and better works moral, and that when these existed production could reach maximum efficiency. They believed that much could be done to bring about improvements here by the establishment of courses throughout their management grades, designed to produce good leadership. It was significant to note that the gas industry was turning its attention to the development of similar courses, presumably with this object in mind. However, sending bright young men on courses could easily result in an increased sense of frustration and impotence once they returned to an unchanged and change-resistant management authority within the industry.

Purification Practice

Mr. K. W. Francombe (Whessoe Ltd.) said that he was a little disappointed to find that only three pages were devoted in the report to the subject of the purification of gases in the United States, though he fully realised that it had not the same significance there as here, owing to the vast preponderance of natural gas which required a minimum of pre-treatment before distribution. Moreover such coal gas as was made seemed largely to be coke oven gas, the purification plant being based on the semi-direct system of ammonia recovery. As a result there was not much in the report to interest the designer of our own conventional wet purification systems, which were generally based on indirect ammonia recovery.

He had gained the impression that, resulting from these circumstances, in this country they had probably studied the design of condensers and electro-detarrers more thoroughly than they had in the U.S.A. The report referred to their 'conventional water-tube condensers,' but here there were several new types of water tube condensers, and electro-detarrers had been widely applied and developed. As an example, no mention was made in the report of the use in the U.S.A. of hot gas electro-detarrers before condensers, on the C.W.G. plants employing heavy oil, in order to avoid tar emulsion troubles, although extensive reference was made to these difficulties. Yet Britain had already started to use electro-detarrers for this purpose.

It would appear from the report that naphthalene removal was effected either in direct type secondary condensers or was incidental to benzole scrubbing, presumably in tower scrubbers. He would be interested to know if the static scrubber which was so widely employed here was ever used in America. They even used such naphthalene scrubbers after tower scrubbers if creosote oils were used for benzole stripping in the towers.

He gathered that, again owing to the preponderance of natural gas with a negligible sulphur content, the gas distributed in the U.S.A. had a much lower total sulphur content than in Britain (though a higher hydrogen sulphide content might be permissible), since there was no restriction placed on the organic sulphur in the manufactured gas of U.K. Thus in the U.S.A. appliance corrosion problems were minimised and pressed steel appliances were widely employed. Problems of air pollution from flueless heaters would also be less acute.

More About Organic Sulphur

Had not the time now arrived when they should do something about the organic sulphur content of town gas? This plea was made by the past President of the North of England Section of the Institution, Mr. G. E. Anderson, in his Presidential Address, and by Mr. W. K. Tate, the Senior Vice-President of the Institution of Gas Engineers, in his contribution to the discussion of the American report in London. It was now over 10 years since the Committee on Sulphur Removal, appointed by the I.G.E., recommended that the organic sulphur content of town gas should be reduced to 10 grains per 100 cu.ft. and that immediate steps should be taken to achieve this result. This view was endorsed in the Heyworth Committee Report of 1945. In 1952 Dr. R. H. Griffith, of the North Thames Gas Board, presented a paper to the American Chemical Society in New York indicating that the N.T.G.B. was contemplating the installation of a larger edition of its Harrow catalytic organic sulphur removal plant at one of the London stations. Was not the time now ripe to consider the widespread adoption of organic sulphur removal plants in provincial gasworks?

Finally, the report emphasised the importance the Americans attached to the system of cathodic protection of buried mains, etc. This subject had also received much consideration in this country and there were at least two companies who could offer expert services in this matter. Perhaps they might now anticipate its more widespread employment over here.

Mr. Dyde said that cathodic protection was certainly not the complete answer in every case; each case had to be taken on its merits. It was true that in their report they were somewhat brief on purification processes operating in the States, but this brevity could be considered to be consequential on the limited amount of gas manufactured in the American industry. Purification in this country was in advance of the practices they observed in the United States. He was of the opinion that the efficiency of their design and operation of condensers and of electro-static detarrers was in advance of American practices. Moreover the use of electro-static detarrers on hot gas was not seen in any of the plants visited and he had no reason to suppose that this method was used in America. There was a very prevalent use of the direct condenser, particularly as a primary unit. They did not encounter any of the multi-film type of mechanical washer scrubber. The types of scrubbers in use, both for ammonia extraction and also for benzole extraction, were of the tower type, very large towers indeed. The electro-static detarrers generally operated at rather higher voltages than were used here—45,000 to 60,000 volts. In one case they did encounter an emergency safety device whereby the current was automatically cut off if the percentage of oxygen to the inlet of the detarrer rose above 2%.

Waste of Natural Gas

Mr. B. Richardson (Newcastle) asked if the Team was convinced that in the United States efficient use was being made of the natural gas. Personally, he thought it was being wasted. Some effort should be made to conserve it.

Mr. Dyde replied that he had a great deal of sympathy with that point of view. But he was afraid that it had not many adherents in America. When he spoke to two conferences in America he told them that they were most prolific in the use of their natural reserves. They were operating very much as Britain used to do when coal was worth £1 a ton.

Mr. G. E. Haddon (Stockton) put the following questions to Mr. Colvin:

(1) Accepting the problem of domestic appliances in the U.K. as somewhat in the order of cooker, washer, portable fire, and other permanent space heaters, followed

by appliances such as poker, refrigerator, drying cabinet, boiling burner, etc., how does this compare with U.S. domestic appliance trends or demand?

(2) Would he comment on the U.S. almost complete preference for storage water heating and the U.K. fairly widespread development of instantaneous water heating?

(3) Has the U.K. anything to learn from such U.S. practices as outside meter sites, the use of meter bars, and the almost complete exclusion of prepayment type meters?

(4) I believe in the U.K. the gas-fitting craftsman is regarded as important within the scope of consumer service, and indeed recruitment from such personnel to other and higher positions is often made. Are conditions comparable in the U.S. in this respect?

Mr. Colvin replied that appliance sales in the United States were in three categories—cookers, water heaters, and whole-house heating. Apart from that space heating, radiators, and gas fires were virtually non-existent. They had developed in America a clothes drier which was a very rapidly increasing load. In the States they had the great advantage of having basements in their houses, and all these appliances were all fixed down there. There would be some difficulty in the small kitchens that were the normal course here. As for storage water heating, the Americans had developed a storage type of heater almost to the exclusion of the instantaneous heater. Regarding outside meter sites, there was a great variation in practice. In the south and in the west nearly all the meters were fixed outside. In the towns in the east they would not allow them to be fixed outside. There were very definite advantages, if the climate admitted it, in having the meters fixed outside, particularly as they were all credit meters and not prepayment meters with coins to be stolen. On meter bars, he thought they could learn something from America. They gave a very neat fixing and solved a lot of installation problems. He thought there were definite advantages to be derived. The gas-fitting craftsman was regarded in America as being very important in consumer service. In the special service range, at any rate, the training was rather more arduous than in this country.

Mr. W. Sutcliffe (Blyth Division) moved a vote of thanks to Messrs. Dyde, Porter, and Colvin, and **Mr. Porter** replied.

MEMBERS of the industrial fuel section of the Sheffield Chamber of Commerce were told by officials of the three industries that coal, coke, gas, and electricity supplies in the area should be sufficient for winter needs; coal stocks, although less than last year, were not as low as they had been, output of gas was increasing, and stocks of gas coke were high. Generating plant capacity was expected to increase by 10% in the year and load spreading was considered to be unnecessary.

SOCIETY OF BRITISH GAS INDUSTRIES GOLFING CIRCLE

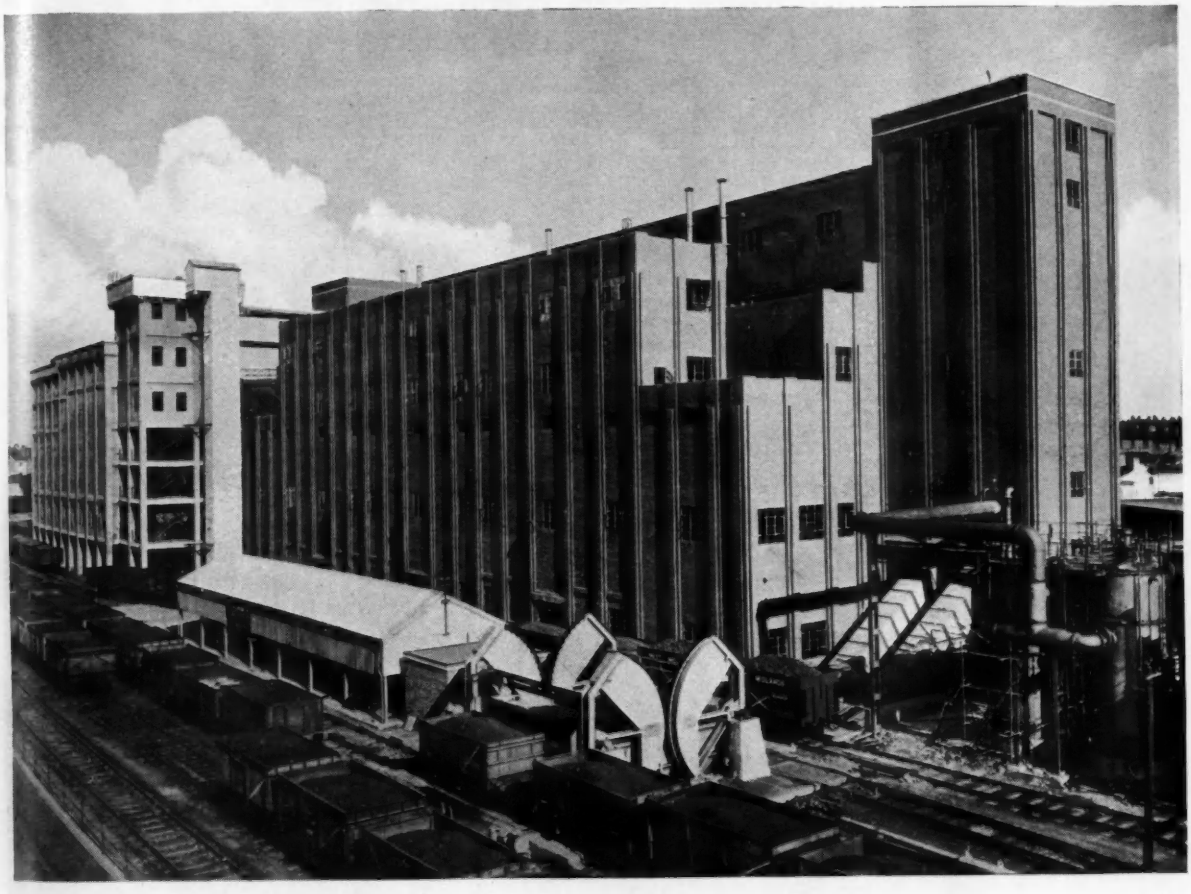
THE Autumn Meeting of the S.B.G.I. Golfing Circle was held on Wednesday, September 30, at Walton Heath Golf Club. Several distinguished guests were present including the immediate past President of the Institution of Gas Engineers, Mr. G. E. Currier, and Colonel W. R. Glover, Chairman of the S.B.G.I. Mr. Currier acknowledged on behalf of the Institution a donation of 10 guineas that had been paid to the Institution Benevolent Fund. The prizes were won by the following:—

Yates Bowl.—1—A. Docking; 2—M. H. Thornton; 3—J. Simpson.

Visitors' Prize.—J. S. Smith.

Foursomes.—1—C. T. C. Woodall and D. H. Pearson; 2—C. A. Macleod and T. C. Battersby.

In the top row of photographs are (a) G. E. Currier, O.B.E. (Immediate Past President of the Institution), with F. D. Drake; (b) Brigadier C. A. S. Fairbank (George Glover & Co., Ltd.), Hon. Treasurer of the Circle, F. D. Drake, who has just given up the Captaincy, and C. T. C. Woodall (Parkinson Stove Co., Ltd.), Secretary and Captain; and (c) Colonel W. R. Glover with Mr. C. Pearson. In the bottom row are (d) W. Pollard (W. J. Jenkins & Co., Ltd.), with J. S. Smith (Ministry of Fuel and Power); (e) A. Gwynne Davies (Secretary, East Midlands Gas Board), T. C. Battersby, and J. Rogers (Sidney Flavel & Co., Ltd.); and (f) E. J. Spurrier (Parkinson & Cowan, Ltd.), and M. Jones (Ministry of Fuel and Power).



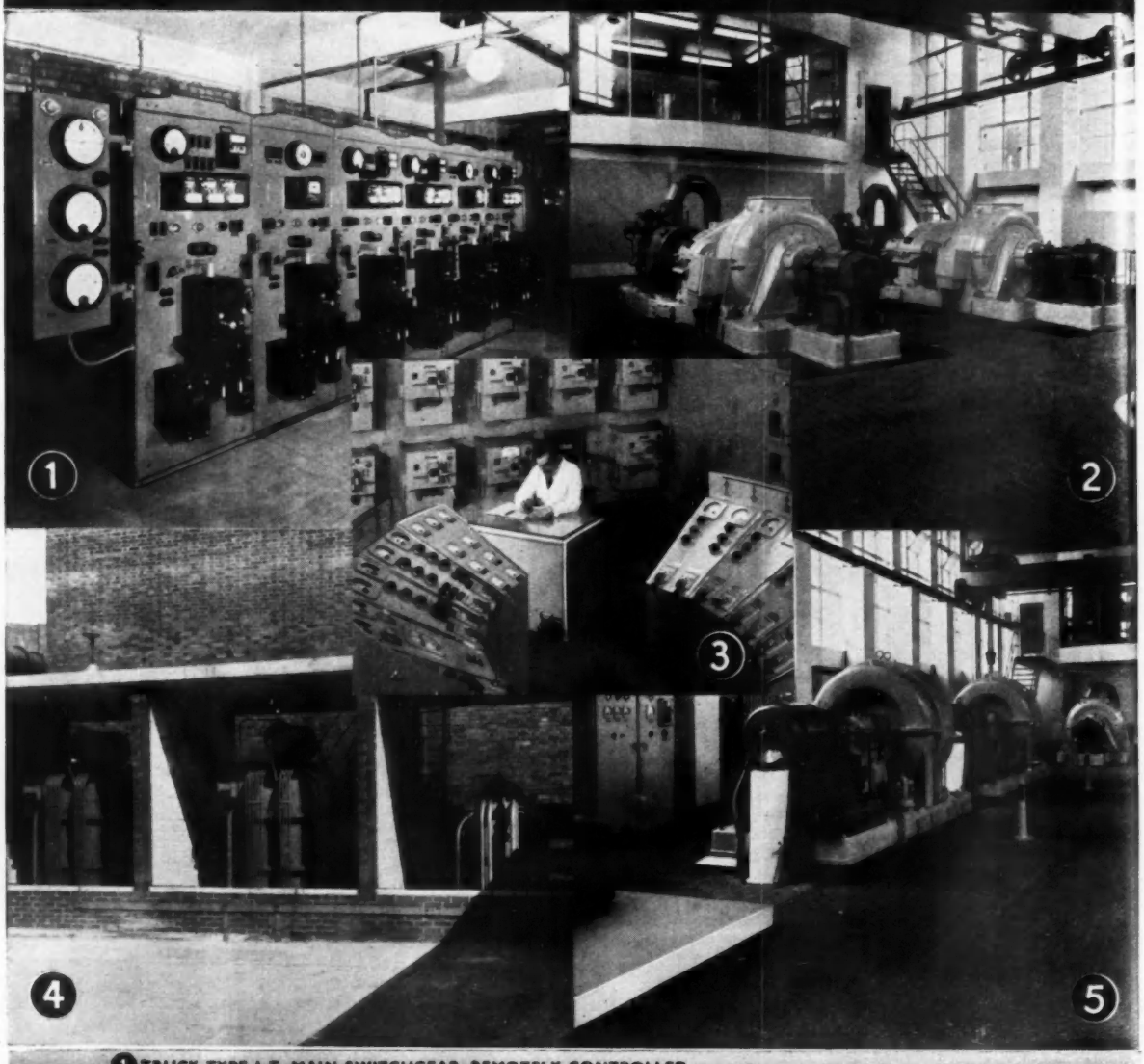
The Continuous Vertical Retort House at
THE NEW SWAN VILLAGE GAS WORKS,
Birmingham Division, West Midlands Gas Board.

WOODALL-DUCKHAM

CONSTRUCTION COMPANY LTD.

Woodall-Duckham House, 63-77 Brompton Road, London, S.W.3.
Phone : KENsington 6355 (10 lines) Grams : Retortical, Southkens, London.

ELECTRICAL EQUIPMENT *serves* SWAN VILLAGE



1 TRUCK TYPE L.T. MAIN SWITCHGEAR, REMOTELY CONTROLLED
2 BACK PRESSURE TURBO-ALTERNATORS, 1750 kVA CAPACITY
3 WITHDRAWABLE TYPE DISTRIBUTION SWITCHGEAR AND CONTROL DESK
4 POWER TRANSFORMERS — 4000 kVA TOTAL CAPACITY
5 EXHAUSTER MOTORS

PHOTOGRAPHS REPRODUCED BY KIND PERMISSION OF WEST MIDLANDS GAS BOARD.
J. E. WAKEFORD ESQ., M.B.E., M.INST.GAS E., M.INST.F., DIVISIONAL GENERAL MANAGER.

ESTABLISHED 1882

THE ELECTRIC CONSTRUCTION COMPANY LTD.

TELEGRAMS ELECTRIC WOLVERHAMPTON

Head Office and Works:
BUSHBURY ENGINEERING WORKS
WOLVERHAMPTON
ENGLAND

TELEPHONE WOLVERHAMPTON 21455 (7 LINES)

Manufacturers of Rotating Electrical Machinery, Switch and Control Gear, Rectifiers and Transformers.

WEST MIDLANDS GAS BOARD

SWAN VILLAGE INAUGURATION

THE new Swan Village Gasworks, which I am privileged to inaugurate to-day, was commenced by the former City of Birmingham Gas Department and has been completed by its successors, the West Midlands Gas Board.

Birmingham has always occupied a leading place in the Gas Industry and, indeed, is looked upon as the traditional home of gas as it was in Soho that William Murdoch began to manufacture gas-making plant on a commercial scale more than a century and a half ago. Through the enterprise, ingenuity, skill and courage of Murdoch and other gas pioneers, this country has been endowed with many material advantages. The Works being inaugurated to-day gives ample evidence that the torch lit by these pioneers is still burning and justifies us in having every confidence in the future of the Gas Industry.

The new Swan Village Works will bring powerful additional resources to the aid of the West Midlands Gas Board in its formidable task of supplying daily the gas requirements of its consumers numbering well over one million.

Harold Smith.

9th October, 1953.

Chairman of the Gas Council.

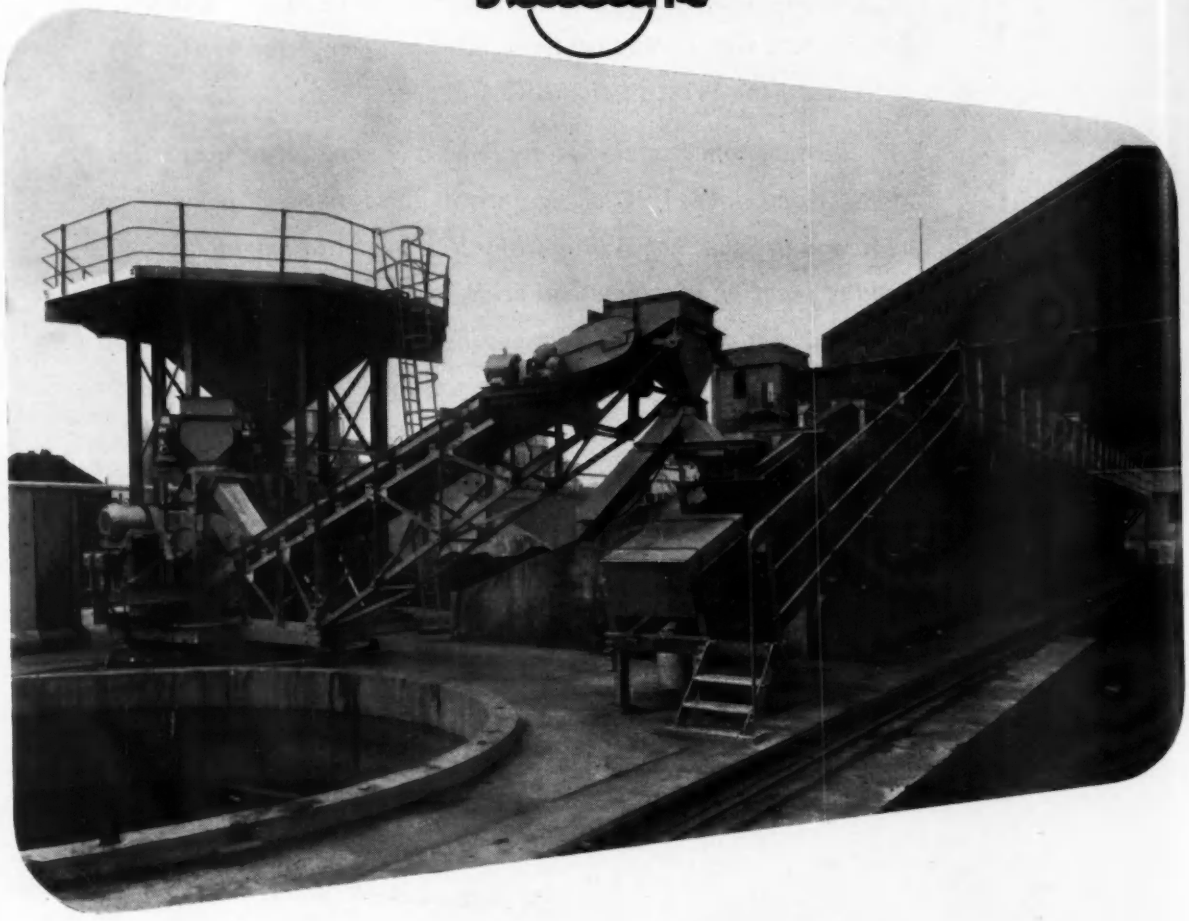
Reproduced from the brochure issued by the West Midlands Gas Board.

The following section of the "Journal" has been devoted to a comprehensive illustrated description of the new works at West Bromwich.

Oxide Handling Plant

by

Sutcliffe



The photograph reproduced by kind permission of the West Midlands Gas Board, shows part of the Oxide Handling Plant at the Swan Village Works.

Sutcliffe

RICHARD SUTCLIFFE LIMITED

HORBURY · WAKEFIELD

TELEPHONE: HORBURY 350 TELEGRAMS: "SUTCLIFFE HORBURY"

BRITAIN'S BEST CONVEYORS

GAS BOOSTERS & EXHAUSTERS

AT SWAN VILLAGE NEW GAS WORKS—WEST MIDLANDS GAS BOARD

2—900 m.m. THREE STAGE TURBO EXHAUSTERS. EACH MACHINE WITH A CAPACITY OF 415,000 CUB. FT. GAS PER HR. AGAINST PRESSURE DIFF. 53" W.G. RUNNING AT 2,830 r.p.m.

DRIVEN BY A 120 H.P. ELECTRIC MOTOR THROUGH FLUID COUPLINGS.

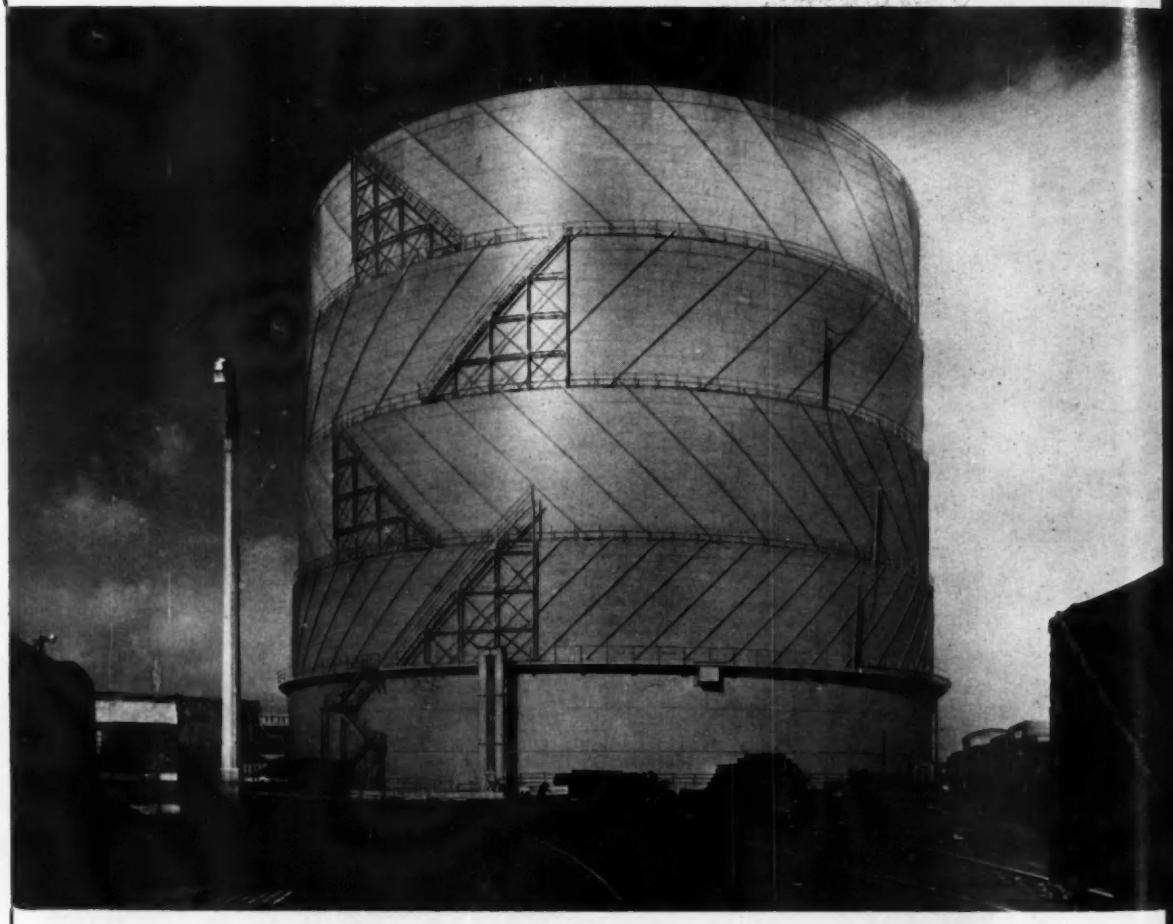
Illustrations by courtesy of W.M.G.B.

1—1,200 m.m. SINGLE INLET TURBO BOOSTER CAPACITY 900,000 CUB. FT. GAS PER HR. AGAINST PRESSURE DIFF. 44" W.G. RUNNING AT 2,860 r.p.m. DRIVEN BY A 185 H.P. ELECTRIC MOTOR THROUGH FLUID COUPLINGS.

THE BRYAN DONKIN COMPANY LTD., CHESTERFIELD

MEMBER OF THE SOCIETY OF BRITISH GAS INDUSTRIES

FIVE MILLION
CUBIC FEET CAPACITY
GASHOLDER and STEEL TANK



COMPLETED MAY 1953 AT

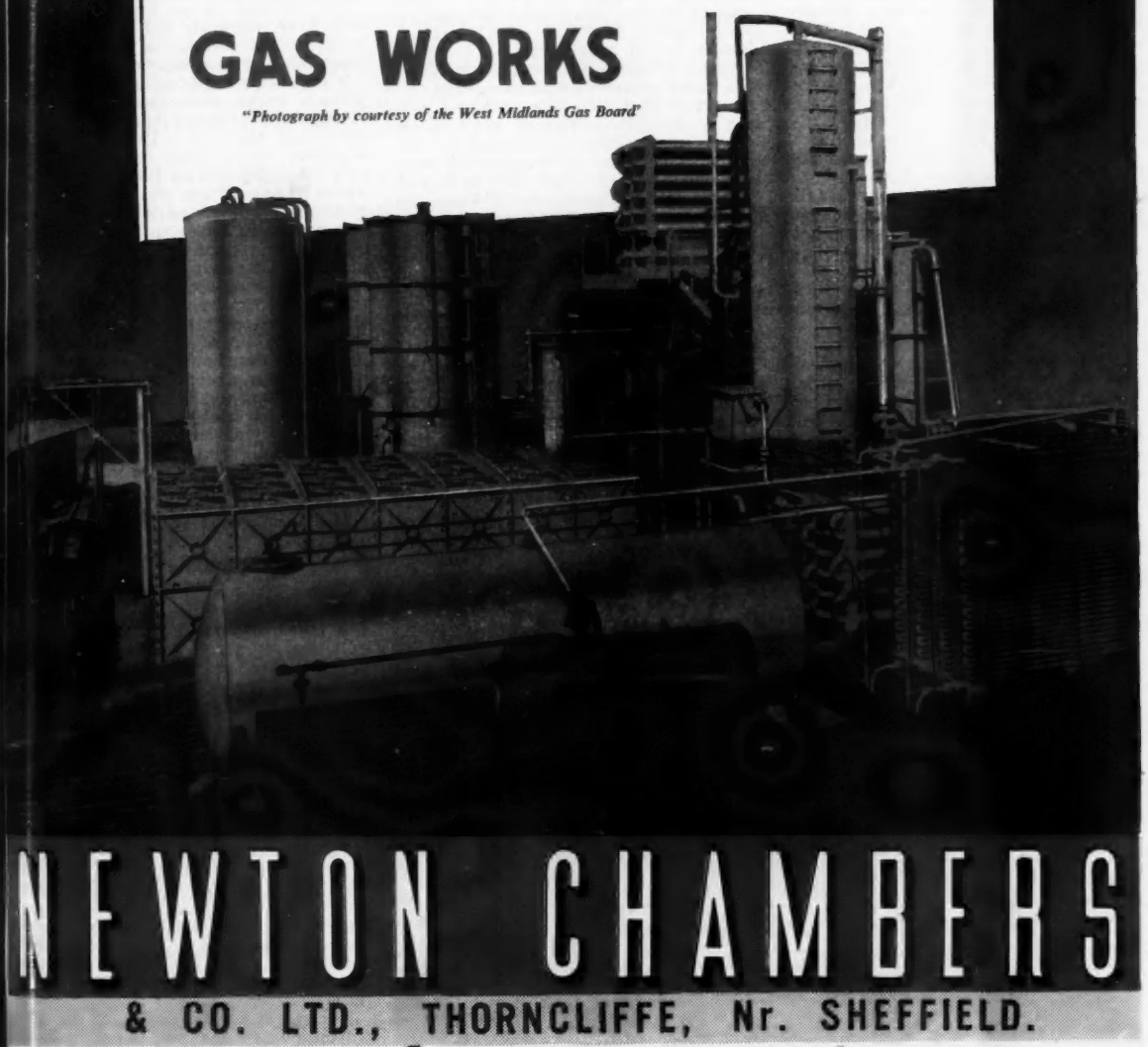
SWAN VILLAGE GASWORKS

BIRMINGHAM DIVISION, WEST MIDLANDS GAS BOARD

CLAYTON SON & CO. LTD.
HUNSLET LEEDS YORKSHIRE

GAS LIQUOR DEPHENOLATION PLANT *for the* NEW SWAN VILLAGE GAS WORKS

"Photograph by courtesy of the West Midlands Gas Board"



NEWTON CHAMBERS

& CO. LTD., THORNCLIFFE, Nr. SHEFFIELD.

NEW GASWORKS AT SWAN VILLAGE

On Friday, October 9, Sir Harold Smith, Chairman of the Gas Council, officially inaugurated the new works of the West Midlands Gas Board—an important occasion as our description shows.

View from entrance to the works.

IN 1825, twenty-eight years after William Murdoch had invented gas-lighting, the Birmingham and Staffordshire Gas Light Company was formed to manufacture and supply gas for lighting Birmingham and the surrounding towns of Bloxwich, Darlaston, Oldbury, Smethwick, Tipton, Walsall, Wednesbury and West Bromwich. For such an ambitious project, a works located near the centre of the supply area was obviously desirable. A site was acquired at Swan Village and a works was constructed which became, in 1829, the largest gasworks in the Kingdom.

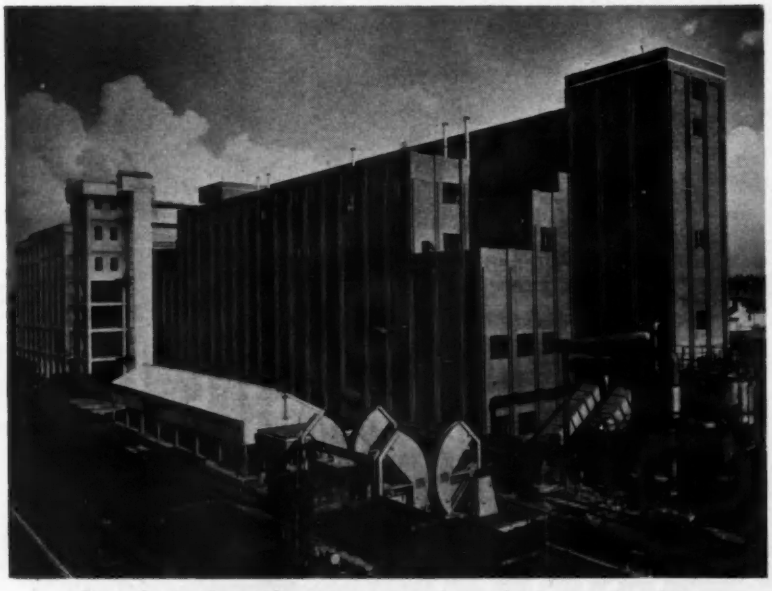
The course of the Birmingham and Staffordshire Gas Light Company did not run entirely smoothly, however, for, although its affairs were flourishing and it was rapidly extending its mains in adjacent towns, it had to face an established rival in Birmingham itself—namely, the Birmingham Gas Light and Coke Company.

Enter Mr. Chamberlain

In 1874 both companies promoted Parliamentary Bills to raise further capital for expansion and they were prepared to amalgamate in order to present a united front to an impatient Council and an exasperated public. The Bills were opposed by the Town Council of Birmingham led by the Mayor, Mr. Joseph Chamberlain, who negotiated the purchase of the companies by the Corporation. The following year the Royal Assent was given to the Birmingham Corporation Gas Bill, and the two companies became public property. Mr. Joseph Chamberlain was elected Chairman of the first Gas Committee, and for many years took a close personal interest in the undertaking.

Swan Village works was acquired by the Birmingham Corporation, but by reason of its location on an island site, the works did not expand to the same extent as the other Birmingham works, although its plant and equipment were continually modernised and improved. A notable development in 1914 was the introduction of the then comparatively new system of coal carbonisation in continuous vertical retorts. This early installation has itself been reconstructed and modernised, and is to-day the sole coal-gas making unit at the old works. At the present time the old works is capable of producing 2,000 mill. cu.ft. of mixed coal gas and water gas per annum. The new and adjoining works will produce a further 3,400 mill. cu.ft. a year.

During recent years interconnecting mains have been laid to neighbouring towns, in some cases to supply gas in bulk and in others to allow an interchange of gas depending upon consumers' demands and availability of manufacturing plant at the various gasworks. The works will be operated as a base-load station.



Rear of retort house showing wagon tipplers and coke screening plant.

The New Works

The demand for gas increased rapidly during the war years and by 1946 it was apparent that substantial extensions of gas-making plant would be necessary. A site of 11 acres, adjoining the old Swan Village works, was available and a scheme was prepared to install a new works on this site. The scheme was approved, in principle, by the Ministry of Fuel and Power in 1947 and authorisation to proceed was given in July, 1948; work on clearing and levelling the site commenced in October, 1948.

It was important that the space available should be developed to produce the maximum possible quantity of gas, but it was also imperative, with dwelling houses in close proximity, that all works buildings should be of pleasing design and local amenities should not be impaired.

It has been possible, within the limitations and physical restrictions of the site, to install coal-gas plant of 8.5 mill. cu.ft. per day capacity, and, by installing a new 3 mill. cu.ft. per day water gas machine in an extension to the water gas house at the old works, to provide for a total production of 11.5 million cubic feet per day.

Economical Working

With this combination of coal gas and water gas plants the retort house will normally operate at high throughputs, making gas of high calorific value and the water gas plant at low calorific value with minimum oil enrichment to produce a mixed town gas of 450 B.Th.U. per cu.ft. This is the cheapest method of working in present circumstances, but the operating conditions can be varied within wide limits by reducing coal throughput in the retorts, using more oil on the water gas plant, and producing less coke for sale while still maintaining the same total production of gas.

In fact, the flexibility of this combination of plant is such that without alteration to total gas made, annual coal requirements can be varied between 180,000 and 138,000 tons, with corresponding variations in coke available for sale between 61,000 and 34,000 tons, based on a load factor of 83%.

The increased rail traffic for the new works necessitated additional railway connections from Swan Village Station on the Western Region main line and the provision of extensive new sidings outside the works to accommodate railway

View showing water softening plant building, retort house, and transformer pens.

wagons. These extensions, comprising a mile of track, four new bridges, and the widening of embankments, were carried out by the Railway Executive.

Coal Handling

Coal is brought into the works in railway wagons and is either stacked for subsequent reclaiming as required or discharged direct into the coal-handling system feeding the vertical retort house. The coal storage ground is virtually an open concrete tank 336 ft. long by 98 ft. wide by 13 ft. 6 in. deep in which some 18,000 tons of coal can be stored. This amount is equivalent to 4.5 weeks peak winter requirements of the works. To avoid dust nuisance to local residents only washed nuts, and of a type normally immune from spontaneous heating, are stored. Spanning the coal storage ground, and running on tracks laid on the reinforced concrete store walls, is a 10½-ton Goliath grabbing crane.

The coal for storage is unloaded from the rail wagons by either of two electric ram end tippers into a grab-pit positioned at the centre of one side of the store. From this pit the coal is transferred to any part of the store by the Goliath crane. The crane, which is electrically operated, will permit stacking to a height of 32 ft. and its grab has a capacity of 5 tons of coal. When operated over an average travel the crane will handle 100 tons of coal per hour, but, when the movement of railway wagons is taken into account, the overall coal-handling rate is 60 tons per hour when stacking and 80 tons per hour when reclaiming. Coal reclaimed from the store is delivered by the grab directly into railway wagons via a retractable hopper chute built as a cantilever extension of the crab track.

Carbonising Plant

The new installation of Woodall-Duckham continuous vertical retorts comprises four benches each containing 16 in. by 82 in. lambent heated retorts with a total guaranteed throughput of 530 tons of coal per day giving a daily gas output of 8,500,000 cu. ft. at a calorific value of 475 B.Th.U.

The retorts are heated by four Humphreys & Glasgow mechanical hot gas producers with a fifth producer acting as a standby. The installation is provided with complete coal, coke, and ash handling plants, producer gas dilution plant, and four waste heat boilers fitted with economisers and superheaters. A 40-cwt. electrically-operated Wadsworth goods and passenger lift is provided.

Dust Extraction

A Drummond dust-extraction plant is provided so that there is no dust or smoke nuisance arising from the coke discharging operation.

The retorts are heated by the lambent heating system using hot dedusted producer gas. There is only one point of admission and control of producer gas on each side of each retort; secondary air for combustion is admitted at three or more levels, thus permitting temperature zoning as required. The retort seating castings and supporting steelwork are cooled by the circulation of secondary air, prior to its admission to the settings, thereby not only safeguarding against overheating but also enabling the producer fuel consumption to be reduced by 7% to 10%.

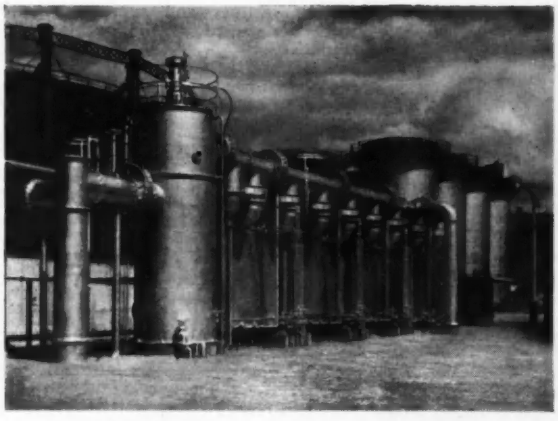
Mechanical Details

Coal is discharged from railway wagons by either of two electrically-operated Strachan & Henshaw 'Rotaside' wagon tipplers of the side-discharge type capable of handling the new 24½-ton coal wagons. The coal is discharged into a brick-lined steel receiving hopper of 80 tons capacity having two bottom outlets from which the coal is fed, via chutes and Locker-Traylor electric vibrating feeders, to either of two inclined tray conveyors. Each conveyor delivers to one of two four-roll coal breakers which reduce the coal to a maximum of about 2 in. cube. Chutes are provided to enable small coal to by-pass the breakers. The coal from the breakers or by-pass chutes is fed by rotary fillers on to either of two gravity-bucket elevators rising in the end bay of the retort house. From these elevators the coal is fed on to either of two 30 in. band conveyors and thence to two 30 in. shuttle band conveyors into the overhead coal storage hoppers arranged above the retort benches. From the storage hoppers, which have a capacity of 48 hours requirements, the coal is fed through rotary valves into the auxiliary supply hoppers attached to the top mouthpieces of the retorts. The gravity bucket elevators are automatically lubricated while in use by pairs of oil guns operated by the movement of the chain.

Each mechanical producer has its own fuel storage hopper of 48 hours capacity. The coke for filling retorts at starting up or after scurfing is discharged from separate storage hoppers into hand-propelled filling skips running on double overhead tracks extending for the full length of the retort benches.

Gas leaves the retorts through gas off-take pipes sprayed with hot liquor and then passes through liquor-sealed dish valves into collecting mains serving eight retorts. Each collecting main is arranged with a fall towards the centre where tar

Control room overlooking power house.



Secondary detarrer and ammonia and oil washers.

Coal store, crane, and gasholder.

and liquor overflow and cleaning box is fitted so that the tar and liquor deposited can run into tar and liquor separating tanks. The decanted liquor overflows to a clean liquor tank and together with 'make-up' liquor is pumped back by means of two electrically-driven centrifugal pumps, one working and one standby, to the sprays in the collecting mains and gas offtakes. Gas leaves each collecting main via a vertical main in which is inserted a butterfly valve operated by an Askania regulator to give precise control of gas pressure at retort offtakes. All vertical mains enter a common foul gas main which carries the crude gas away from the retort house.

Mechanical Producers

For heating the retorts four 8 ft. diameter Humphreys & Glasgow mechanical producers are provided, with a fifth acting as a standby. Mechanical producers were chosen as they eliminate the arduous manual labour of fire cleaning, give ease of control of quantity and quality of producer gas, and, most important of all, are capable of gasifying the smaller graded sizes of coke that cannot be used satisfactorily on step-grate producers. The coals carbonised at the works, coming mainly from the East Midlands field, give rise to a high proportion of small sized coke and it is a great advantage to have facilities for using these sizes for retort heating. The producers are provided with annular boilers which generate sufficient steam at 20 lb. per sq. in. to saturate the air blast to the producers.

The grate, together with the ash pan, is rotated at a rate varied to suit different types and grades of fuel; and the ash and clinker, quenched and dustless, are extracted through the water seal and discharged into ash skips. The grate is driven electrically through a worm meshing, with a worm wheel enveloping the grate base. Air blast is provided from four electrically-driven blowers, any two of which are large enough to supply the necessary air to four producers.

Each producer is rated to gasify 18 tons of No. 4 coke (¼ in. to ½ in.) per day, but it is possible to heat the retort setting with three producers gasifying No. 3 coke (¼ in. to 1¼ in.), thus ensuring continuity of gas production in the event of a breakdown on one producer when one is already off for overhaul. This flexibility has a further advantage in that extra producer gas can be made available for dilution purposes during periods of exceptional peak demand.

This extra gas is available at any time with no additional labour requirements, and for virtually no extra capital, but requires further oil enrichment on the water gas plant to compensate for the low calorific value of the producer gas.

The producer gas leaving the producers passes through cyclone dust separators which remove all but the finest dust particles and then goes forward to the retort settings at a temperature in the region of 500°C.

The layout of the producers, in relation to the producer gas main and retort benches, is such that the portion of producer gas main to any one bench can be isolated for repairs without affecting the working of the other benches or the availability of a spare producer.

The ash automatically discharged by the mechanical producers passes into skips on stillages which are carried by means of two petrol-driven Lister autotrucks to the skip hoist. The ash skips are elevated by a hoist to an overhead ash storage hopper whence ashes are discharged at intervals into road vehicles: the operations of hoisting, tipping, and lowering of skips are carried out automatically.

Each bench of 16 retorts is provided with its own waste heat boiler, superheater, and economiser. The total steam output from the four benches is rated at 22,000 lb. per hour at 350 lb. per sq. in. and superheated to 650°F. The steam generated passes to back-pressure turbo-alternator sets exhausting at 20 lb. per sq. in. and the exhaust steam is used for process work on both the new and the old works.

Ventilation Equipment

Two cold-air circulation plants, one for each two benches, are provided to assist in the ventilation of the retort house by delivering cold air along the full length of each bench at top damper platform level on the waste gas main side. Each fan delivers 9,600 cu.ft. of air per min. To assist in retort house cleanliness two vacuum cleaning plants are provided with hose-coupling points distributed throughout the plant.

Each of the Sturtevant plants comprises a horizontal turbo-exhauster, multiple vee-rope driven by a 7½ H.P. electric motor, and connected at the suction end to a filter receiver. This consists of a cylindrical, steel, primary receiver with multi-bag filter, hoppered at the bottom and equipped with a hand-operated discharge valve, complete with bagging attachment. From each filter receiver, connection is made to a suction main fitted with a large number of hose connections of standard type for horizontal application, and counterbalanced-lid type for vertical application, the main and its connections covering strategic cleaning points throughout the retort house.

The cleaning tools and accessories are designed to meet the specially arduous and dusty conditions normally existing in retort houses, and are used through the intermediary of curved floor handles, and when necessary, extension tubes, or directly, at the end of 1¼ in. bore flexible metallic or flexible rubber suction hose, depending upon the cleaning duty being undertaken. For bare floor cleaning each plant accommodates one operator, but two or more operators can work simultaneously with the lighter cleaning accessories when brushing down walls, ledges, valves, and similar items.

Coke Handling and Screening

The Saxon coke screening plant comprises horizontal reciprocating conveyor screens separating the sizes progressively from the largest to the smallest in the following grades: No. 1, over 2 in.; No. 2, 1¼ in. to 2 in.; No. 3, ¼ in. to 1¼ in.; No. 4, ⅛ in. to ¼ in.; breeze through ⅛ in.

The screening plant building is of reinforced concrete construction and incorporates storage bunkers for 48 hours make of coke; the coke can be loaded into railway wagons or lorries, and vibrating de-breezing screens are fitted to all hopper outlets. No. 2 and No. 3 coke can be carried by inclined band conveyor to separate hoppers for bagging in hundredweights and for ¼-cwt. sales to yard customers. All weighing is by Avery automatic machines.

Saxon dry-cleaning tables are provided to deal with all the No. 3 and No. 4 coke which invariably contain more 'bats' than the larger sizes. The operation of these vibrating tables depends on the 'floating' of coke on an inclined perforated table with carefully balanced air blast beneath. The lighter coke is lifted off the table and discharged at the lower end, while the heavier bats, unaffected by the rising air blast, ride up the vibrating table and discharge over the end into separate hoppers.

The screens and dry-cleaning tables are arranged in two independent lines over the storage bunkers, each line capable of dealing with the maximum make of coke, so that maintenance work can be carried out on one line without shutting down the plant.

Great care has been taken to ensure that all operatives work in a clean atmo-

sphere; the two lines of screens and tables have been separated by a corridor, formed of steel and glass partitions, so that maintenance staff can work on one line of screens under good conditions while the other line is in operation. All starter buttons are fixed in this corridor and the screen attendant remains in a clean atmosphere to watch and control all operations.

A vacuum cleaning plant is provided with suction pipes running alongside the screens and tables and the attendant can clean up between 'draws' without inhaling coke dust.

A 30-cwt. Wadsworth goods and passenger lift is installed giving access to all floors of the screening plant.

Water Gas Plant

A new Humphreys & Glasgow automatically-operated water gas machine, of 3 mill. cu.ft. per day capacity, has been installed in an extension to the water gas house at the old works to augment the gas production from the new works to a total of 11.5 mill. cu.ft. of gas per day. The water gas machine is designed to produce gas of any calorific value from 300 to 600 B.Th.U. per cu.ft., although normal production is nearer the lower figure.

The plant comprises self-clinkering generator, carburettor, superheater, washer, and primary condenser. Waste heat steam is generated in a horizontal boiler at 135 lb. per sq. in. and superheated by 200°F., and low-pressure process steam at 35 lb. per sq. in. is produced in the generator annular boiler.

A coke storage bunker holding 125 tons (48 hours supply) is filled by a traversing skip hoist fed from an underground receiving hopper and discharges direct into the overhead storage hopper. The water gas is piped to the new works, where it is metered and then enters the coal gas stream at the outlet of the ammonia washers.

The whole of the steam generated in the waste heat boilers at 350 lb. per sq. in. passes direct to back pressure, turbo-alternating sets, exhausting at 20 lb. per sq. in. for works processes; the output of electricity is approximately 700 kW. No fuel-fired boilers have been installed; in fact, the works is more than self-supporting in steam as considerable quantities of low-pressure steam are available for processes on the old works.

The electric power generated from the waste heat steam is not sufficient for works power requirements at all times, owing particularly to the heavy demands of current by the gas boosting plant which distributes gas to Birmingham and adjoining towns. Accordingly, two independent grid supplies at 6,600 volts have been provided which are interlinked and paralleled with the works supply. This arrangement of complete duplication of electricity supplies, combined with the works generation, ensures maximum protection against failure of any one source of supply.

Electrical Arrangements

The whole of the works electrical arrangements are centred in an elevated control room overlooking the power house. This control room contains the low-tension 415 volts switchgear to a 36-panel distributing board feeding the various starter panels grouped about the works. From this room a complete picture is obtained of the load on all electric motors on the works and in case of failure of any supply for any reason an alternative feed can be switched in. Also in the control room and under the eye of the attendant is a large instrument panel recording all essential information on steam, water, and gas temperatures, pressures, etc., relating to the works as a whole.

All drives, including exhausters and boosters, are by squirrel cage electric motors with local and remote push-button starting and stopping. Large drives are provided with fluid couplings to relieve the heavy starting torques, and where speed variation is required the fluid couplings are scoop controlled. Motors for driving exhausters and boosters where there is potential risk of gas leakage are pressurised from fans drawing air from outside the buildings.

The sources of water supply are:—

(1) Town water in limited quantities at 12° hardness.
(2) Underground supplies from disused mine workings, at constant low temperature, 80° hardness and *p*H value of 6.5
(3) Canal water at 20° hardness to 40° hardness and variable temperature.

The underground source has been tapped by sinking two wells, each provided with vertical spindle pumps of 50,000 gal. per hour capacity, submerged to 450 ft. and driven by 100 H.P. motors. This source provides the primary supply of water for cooling purposes, with canal water in reserve. The underground water is slightly acid and the pump shafts and bearings are rubber covered and the casings and impellers are of phosphor bronze.

The canal water, if and when required, can be delivered by two pumps each of 70,000 gal. per hour capacity, and the water is filtered primarily by meshes fitted in the pump suction sump and also by rotary mechanical filters on the pump deliveries. A 30,000-gal. reinforced-concrete water storage tank is provided on top of the coke screening plant building.

Town water from the South Staffordshire Waterworks Company is treated for boiler feed in a John Thompson-Kennicott water softening plant which can, in an emergency, also deal with well water and make it suitable for the waste heat boilers operating at 350 lb. per sq. in. The plant is of the hot process lime-soda type capable of dealing with 60,000 lb. of water per hour.

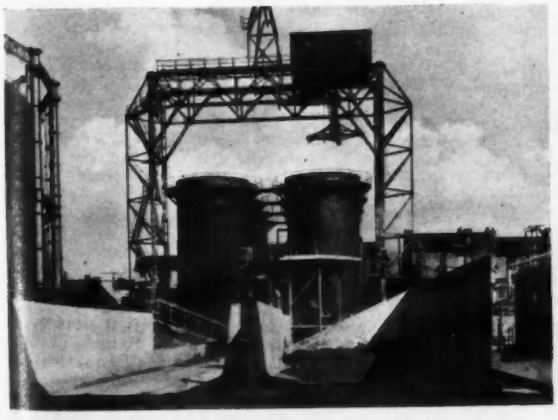
The water, at 120°F., is taken to the plant from a water preheater inserted in the gas stream at outlet retort house and is further raised to 160°F. by means of low-pressure steam directed into an open-type tray heater.

After treatment the water passes to the de-aerator and thence to a covered boiler feed tank in which further preheating is carried out by means of flash steam from boiler blowdowns. This arrangement minimises the risk of air pick-up after de-aeration. To take care of any residual oxygen and hardness, slug feeds of sodium sulphite are injected into the feed mains and of di-sodium phosphate into individual boilers at regular intervals.

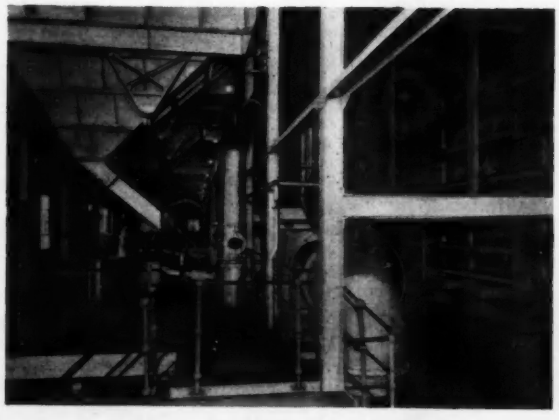
Gas Cleaning and Cooling

Two Whessoe-W-D. hot gas detarrers are installed at the immediate outlet of the retort house in order to remove the heavy tar and the majority of the polyhydric phenols before the liquor is condensed. This treatment, combined with the subsequent removal of the monohydric phenols from the liquor in a dephenolating plant, and followed by liquor concentration, materially improves the quality of effluent liquor discharged to the sewers. Each detarrer is designed to deal with 6 mill. cu.ft. per day and the two treaters will normally operate in parallel for the full load of 8.5 mill. cu.ft. per day, although one treater can deal with this full load at 90% efficiency.

To utilise some of the sensible and latent heat in the gas leaving the hot detarrers, a vertical water tube double-pass water preheater has been installed between these detarrers and the primary condensers. This preheats town water to 120°F. before passing to the softening plant.



Tower purifiers, Goliath crane, and oxide storage bins.



Mechanical producers, charging stage.

Whessoe Condensers

Three Whessoe vertical water tube multi-pass gas condensers are installed, each of 4.5 mill. cu.ft. per day capacity, arranged in parallel so that one unit can act as a standby. They are designed to work on hard well water and to cool the gas to 65°F. To minimise scale formation, provision is made to limit outlet water temperature to a maximum of 100°F. The tubes are galvanised and the water chambers shot blasted and zinc sprayed to combat the corrosive tendencies of the well water.

Two three-stage Bryan Donkin turbo-exhausters are installed in the power house, with two turbo-alternators and four Connersville meters. The exhausters are designed for a top speed of 2,860 r.p.m. driven by 2,950 r.p.m. motors of 110 H.P. through scoop-controlled fluid couplings to give the speed variation down to 50%. Each exhauster is capable of dealing with 415,000 cu.ft. of gas per hour at a pressure difference of 53 in. water gauge. A butterfly valve in the inlet main, operated by hydraulic governor, controls the gas pressure in the retort house foul mains.

A single secondary Whessoe-W-D. detarrer has been provided at the outlet of the exhauster practically to eliminate the small amount of tar fog arising from condensing and remaining after the turbo-exhausters. Three Whessoe four-bay static washers are provided in series with gas connections arranged for any washer to be by-passed if necessary. A liquor strength of 14 oz. can be attained on full load with all washers in operation.

Cold effluent liquor from the liquor concentration plant is fed to the last washer in lieu of water or weak liquor to avoid increasing the volume of liquor for disposal.

A single four-bay Whessoe static washer has been installed to deal with 11 mill. cu.ft. of mixed coal gas and water gas per day. Its purpose is to reduce the dew-point of any oil or gum-forming vapours which might otherwise condense in the oxide purifiers and adversely affect their operation.

Gas oil is fed at the rate of 40 gal. per mill. cu.ft. and the oil overflow is returned to the carburetted water gas plant at the old works. This scrubber also serves to remove naphthalene.

Tower Purifiers

The dry purification plant comprises six Holmes tower purifiers, designed for the removal of H_2S from 8.5 mill. cu.ft. of coal gas and 2.5 mill. cu.ft. of water gas per day. Stocking towers, stocking frame and Goliath crane are provided and to give access to the top platforms around the towers a Wadsworth 20-cwt. lift is installed.

The six towers, each 22 ft. 3 in. diameter by 52 ft. 9 in. high, are connected in series and each has 12 removable containers. Spare containers are kept ready filled with fresh oxide in the stocking frame and, using the Goliath crane spanning the site, one tower can be emptied and refilled in 8 hours.

Oxide containers are subsequently transferred individually to an unloading gantry and oxide is discharged to a receiving hopper beneath. The oxide handling arrangements, installed by Richard Sutcliffe, Ltd., include the provision of a Jeffrey Diamond roll crusher, Crone & Taylor disintegrator, and inclined band conveyor in one rotatable unit which can be directed to fill oxide containers for re-use in the towers or, alternatively, to discharge oxide to storage bins via a band conveyor incorporating oxide sampling arrangements.

The Strachan & Henshaw Goliath crane carries a 5-ton auxiliary hoist with automatic grab to assist in the handling of oxide on the ground and in the loading and unloading of spent and new oxide to and from railway trucks.

All gas made is metered through four Holmes-Connersville meters situated in the power and exhauster house. Three meters each of 250,000 cu.ft. per hour capacity deal with purified mixed gas, and one meter, 150,000 cu.ft. per hour, measures the unpurified water gas prior to admission to the coal gas stream.

All ammoniacal gas liquor is treated at the old works in dephenolating and concentrating plants installed by Newton Chambers & Co., Ltd., in order to produce an effluent acceptable into the local sewers. Dephenolation of the liquor is carried out by intimate mixing of liquor and oil in centrifugal pumps followed by separators. The phenol is transferred to solution in the oil and the liquor passes on to the concentrating plant. The oil is subsequently washed with caustic soda and the dephenolated oil returned to the plant for re-use. The spent caustic soda solution is removed to a tar works where phenol is extracted and the restored caustic soda solution is returned to the plant. The dephenolating plant can deal with a maximum of 48,000 gal. of liquor per day.

Liquor concentration is carried out in two plants of 30,000 gal. and 16,000 gal. per day capacity respectively, using low-pressure steam from the back-pressure electricity generating sets. Storage for crude and effluent liquor is sufficient to enable both plants to be shut down in turn for maintenance and cleaning in the summer. Liquor is produced at a strength of 23% ammonia and removed for sale by road tankers.

Gas Boosters and Storage

The whole of the gas from the old and new works (21 mill. cu.ft. per day maximum) is distributed to three medium-pressure mains. This duty is met by three electrically-driven Bryan Donkin boosters, two having a capacity of 1.2 mill. cu.ft. per hour each at 90 in. W.G., and one of 0.9 mill. cu.ft. per hour at 42 in. W.G. outlet pressures. Any two boosters will deal with the maximum hourly demand with the third acting as a standby.

Gasholder storage has been augmented by the installation of a new four-lift spiral guided holder in steel tank with a capacity of 5 mill. cu.ft. constructed by Clayton Son & Co., Ltd. Anti-freezing arrangements consist of hot water circulation to tank and cups, the water being heated by low-pressure steam. The whole of the steelwork for this gasholder was pre-treated at makers' works by the phosphoric acid pickling process which leaves an inhibiting film on the surface of the metal as a protection against rusting.

All railway traffic for old and new works is handled by two new Andrew Barclay diesel locomotives of 204 H.P., with two old steam locomotives in reserve. All are housed in the new loco shed with facilities for cleaning, maintenance, and repairs.

Particular emphasis has been placed on the architectural design of works buildings, as the site adjoins a residential area. The retort house, power house, water softening plant, and entrance buildings have all been constructed with the same facing bricks to present an attractive appearance.

Interior view of power house.

Special attention has been paid to the welfare of all works personnel. An annex to the retort house contains locker rooms, washing accommodation, shower baths, lavatories, and a messroom for shift-workers. All workmen have two lockers each—one for working clothes and one for clothes in which they travel to and from their work. Separate locker, washing, and lavatory accommodation is provided in each building for keymen attending switchboards, exhausters, water softening plant and boosters. Purifier men also have their own messroom, locker room, and washing facilities.

The works surgery is fully equipped and a fully trained first-aid man is in attendance at all times. A nursing sister on the Board's staff pays frequent visits, while the medical officer attends each week to examine new entrants and to see any employees by appointment.

A new canteen and social centre for

manual employees and staff has been built to serve the old and new works. The accommodation includes kitchens, a large dining hall, suitable also for concerts and social functions, staff dining room, billiard room, reading rooms, cloak rooms, etc.

Main Contractors

SITE LEVELLING, DRAINS, ROADS AND INTERNAL RAILWAYS—Robert M. Douglas (Contractors), Ltd.

EXTERNAL RAILWAY SIDINGS—Railway Executive, Civil Engineering Work (*Track by Wilson, Lovatt & Sons, Ltd.; Steel bridges by Horseley Bridge & Thos. Piggott, Ltd.*)

CARBONISING PLANT—Woodall-Duckham Construction Co., Ltd.; (*Mechanical producers by Humphreys & Glasgow, Ltd.; Wagon tipplers by Strachan & Henshaw, Ltd.; Coal and coke handling plant by Babcock & Wilcox, Ltd.; Dust extraction plant by Drummond Patents (Holdings), Ltd.; Vacuum cleaning plant by Sturtevant Engineering Co., Ltd.; Air circulation plant by Aerex, Ltd.; Economisers by Senior Economisers, Ltd.; Ventilating plant by Davidson & Co., Ltd.; Lift by Wm. Wadsworth & Sons, Ltd.; Skip hoist by Humphreys & Glasgow, Ltd.*)

REINFORCED CONCRETE CRANE GANTRY AND COAL STORE—Parsons & Morrin, Ltd.

GOLIATH CRANE AND TIPPLERS FOR COAL STORE—Babcock & Wilcox, Ltd.

WATER GAS PLANT—Humphreys & Glasgow, Ltd.

REINFORCED CONCRETE COKE PLANT BUILDINGS—Robert M. Douglas (Contractors), Ltd.

COKE SCREENING PLANT—Saxon Engineering Co., Ltd.

POWER HOUSE AND ENTRANCE BUILDINGS—Smith Bros. (Construction), Ltd.

EXHAUSTERS—Bryan Donkin Co., Ltd.

ELECTRIC GENERATING PLANT—Belliss & Morcom, Ltd. (*Alternators by Electric Construction Co., Ltd.*)

ELECTRO DETARRERS, CONDENSERS, AND WET PURIFICATION PLANT—Whessoe, Ltd.

TOWER PURIFIER FOUNDATIONS—Robert M. Douglas (Contractors), Ltd.

TOWER PURIFIERS—W. C. Holmes & Co., Ltd.

OXIDE HANDLING PLANT—Richard Sutcliffe, Ltd. (*Oxide breaker by Jeffrey Diamond, Ltd.; Disintegrator by Crone & Taylor, Ltd.*)

METERS—W. C. Holmes & Co., Ltd.

GASHOLDER FOUNDATIONS— Robert M. Douglas (Contractors), Ltd.

GASHOLDER—Clayton, Sons & Co., Ltd.

BOOSTER HOUSE—Parsons & Morrin, Ltd.

GAS BOOSTERS—Bryan Donkin Co., Ltd.

GAS CONNECTIONS—Clay Cross Co., Ltd.; Stanton Ironworks Co., Ltd.; Staveley Iron & Chemical Co., Ltd.; Westwood & Wrights, Ltd.; A. J. Riley & Son, Ltd.

GAS VALVES—Westwood & Wrights, Ltd.

MAINLAYING—Whittaker Ellis, Ltd.

REINFORCED CONCRETE TAR AND LIQUOR STORAGE TANKS—Robert M. Douglas (Contractors), Ltd.

TAR, LIQUOR, AND WATER PUMPS—Pulsometer Engineering Co., Ltd.

LIQUOR DEPHENOLATING AND CONCENTRATING PLANT—Newton Chambers & Co., Ltd.

EFFLUENT STORAGE TANK—Clayton, Sons & Co., Ltd.

ELECTRIC MOTORS, SWITCHGEAR AND TRANSFORMERS—Electric Construction Co., Ltd.

ELECTRIC STARTERS—Donovan Electrical Co., Ltd.

ELECTRIC PANELS—Brush Electric Co.

ELECTRIC CABLES—Callenders Cables, Ltd.

WATER SOFTENING PLANT HOUSE—Robert M. Douglas (Contractors), Ltd.

WATER SOFTENING PLANT—John Thompson Kennicott, Ltd.

DEEP WELLS—Isler & Co., Ltd. (*Pumps by Sulzer Bros.*)

STEAM PIPES—Power Piping Co., Ltd.; David F. Wiseman & Sons.

LAGGING—W. J. Tranter, Ltd.

RAILWAY MATERIAL—Thos. W. Ward, Ltd.

DIESEL LOCOMOTIVES—Andrew Barclay, Sons & Co., Ltd.

CAPSTANS—Clarke Chapman & Co., Ltd.

WEIGHBRIDGES—W. & T. Avery, Ltd.

LIFTS—Wm. Wadsworth & Sons, Ltd.

HAND TRAVELLING CRANES—Vaughan Crane Co., Ltd.

INSTRUMENTS—Electroflo Meters Co., Ltd.; Milnes Meters, Ltd.; Walker, Crossweller & Co., Ltd.; Thos. Thorp & Co., Ltd.; Arca Regulator Co.; Reavell & Co.

HEATING, HOT WATER SUPPLY, VENTILATING—Paragon Heating Co., Ltd.

BOUNDARY FENCING—Hill & Smith, Ltd.; Parkfield Concrete Products, Ltd.

BRICKS—Blockley Brick Co.

LABORATORY FITTINGS—W. & J. George & Becker, Ltd.

OFFICE FURNITURE—Roneo, Ltd.

STEEL LOCKERS—Speedwell Gear Case Co., Ltd.; Gibbons & Co.

WALL UNITS FOR OXIDE HANDLING AND STORAGE PLANT—Stelcon (Industrial Floors), Ltd.

[*For the photographs illustrating our account of the Swan Village works we are happy to acknowledge the co-operation of the West Midlands Gas Board and the Woodall-Duckham Construction Company, Ltd.*]

Twenty-nine tenants of municipal houses in the Laverock-Broadsands area of Kirkwall are asking the Town Council to install gas, as many are cooking on oil stoves in preference to using electricity. There are no gas mains in their area, but the Gas Board is prepared to lay these, provided the Town Council will meet half the cost of the service from the pavements to the backs of the houses.

WADSWORTH LIFTS at Swan Village

Wadsworth Lifts were once again chosen for the New Swan Village Works of the West Midlands Gas Board, and supplied to the order of The Woodall-Duckham Co. Ltd.: W. C. Holmes & Co. Ltd. and The Saxon Engineering Co. Ltd.

A unique experience of service to the Gas Industry ensures in every Wadsworth Lift that attention to detail which brings freedom from breakdown and saves on maintenance.

There are over 300 Wadsworth Lifts in Gasworks in Great Britain alone.

Coke screening plant and retort house, equipped with Wadsworth Lifts.

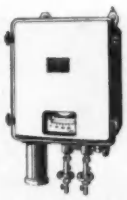
For Reliability... Specify WADSWORTH!

WM. WADSWORTH & SONS LTD. BOLTON AND LONDON. WM. WADSWORTH & SONS (SA) (PTY) LTD. JOHANNESBURG AND DURBAN.
MIDLANDS OFFICE: 5 EDMUND STREET, BIRMINGHAM 3. TEL.: MIDLAND 1628.

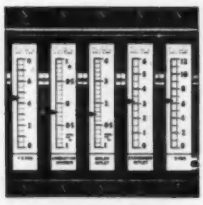
ELECTROFLO INSTRUMENTATION at the NEW SWAN VILLAGE WORKS

of the West Midland Gas Board

Electrical transmitting steam & water flow manometer.



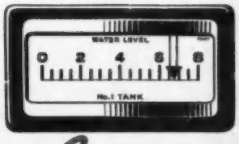
Electrical transmitting gas flow meter.



Multipoint vacuum & pressure indicator.

Multipoint Temperature indicator.

Circular recorder for flow, pressure etc.



17" Scale indicator for level, pressure etc.

TWO WASTE HEAT BOILER PANELS
Covering all necessary flow, draught, temperature and CO_2 measurements. Enclosed cubicles at boiler level.

TWO RETORT PANELS (TOP OF SETTING)
Governor control recorders, liquor and foul main pressures, gas temperatures, waste gas main suction. Enclosed cubicles.

TWO RETORT PANELS (BOTTOM OF SETTING)
Retort steam flows and pressures. Enclosed cubicles

ONE PRODUCER PANEL
Producer steam flow, CO main pressure recorder, Calorimeter.

FIVE MECHANICAL PRODUCER CONTROL PANELS
Multipoint pressure indicators for producers and separators, Steam flows and pressures, blast saturation temperature, etc. Grate controls, recording pyrometers and air flow meters.

POWER HOUSE CONTROL ROOM PANEL
Turbine and pass-out steam flows. Water flows and tank levels. Steam pressures and temperatures. Various measurements for general supervisory control.

For complete Instrumentation on the Works

Consult **ELECTROFLO METERS CO. LTD**

Head Office: ABBEY ROAD, PARK ROYAL, LONDON, N.W.10.
Factories: ABBEY ROAD, LONDON, AND MARYPORT, CUMBERLAND.

Even in those days
STAVELEY
PIPES CARRIED THE GAS
to public and domestic fittings upon which the full force of the Victorian metal workers' art had been lavished. From those early days of the "new gas light" right up to the present moment Staveley pipes have maintained their leadership in serving the gas, water and sewage disposal requirements of communities at home and abroad
STAVELEY

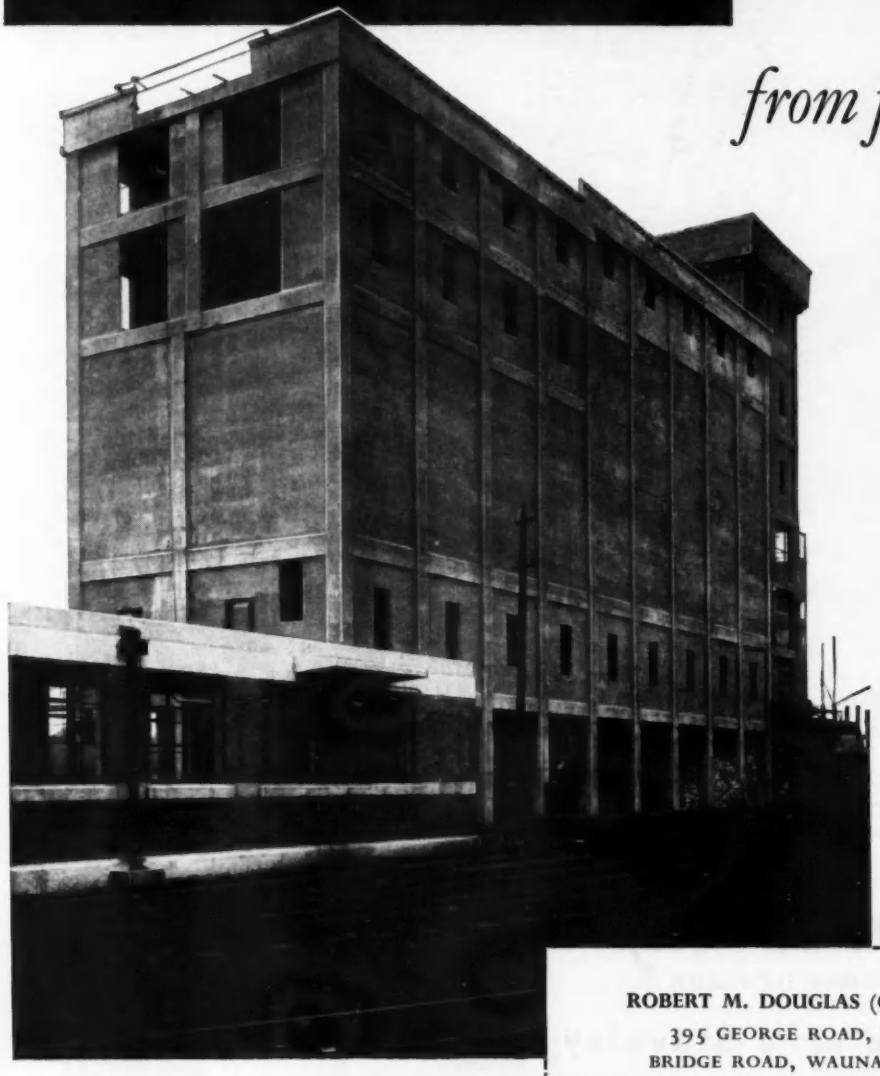
and to-day

The name **Staveley** has been associated with the supply of considerable quantities of cast iron pipes to the New Swan Village Gasworks, Birmingham

THE STAVELEY IRON & CHEMICAL CO. LTD. NR. CHESTERFIELD

DOUGLAS builds

from first to last



Another DOUGLAS contract —the construction of coke bunkers, purifier foundations, engine sheds, retaining walls, gas holder foundations, coke storage bins, laying of railway sidings, installation of weighbridge and building of weighbridge house, roads and drainage for the West Midlands Gas Board at Swan Village Gas Works.
(*Henry M. Hale and Partners, Chartered Structural Engineers*).

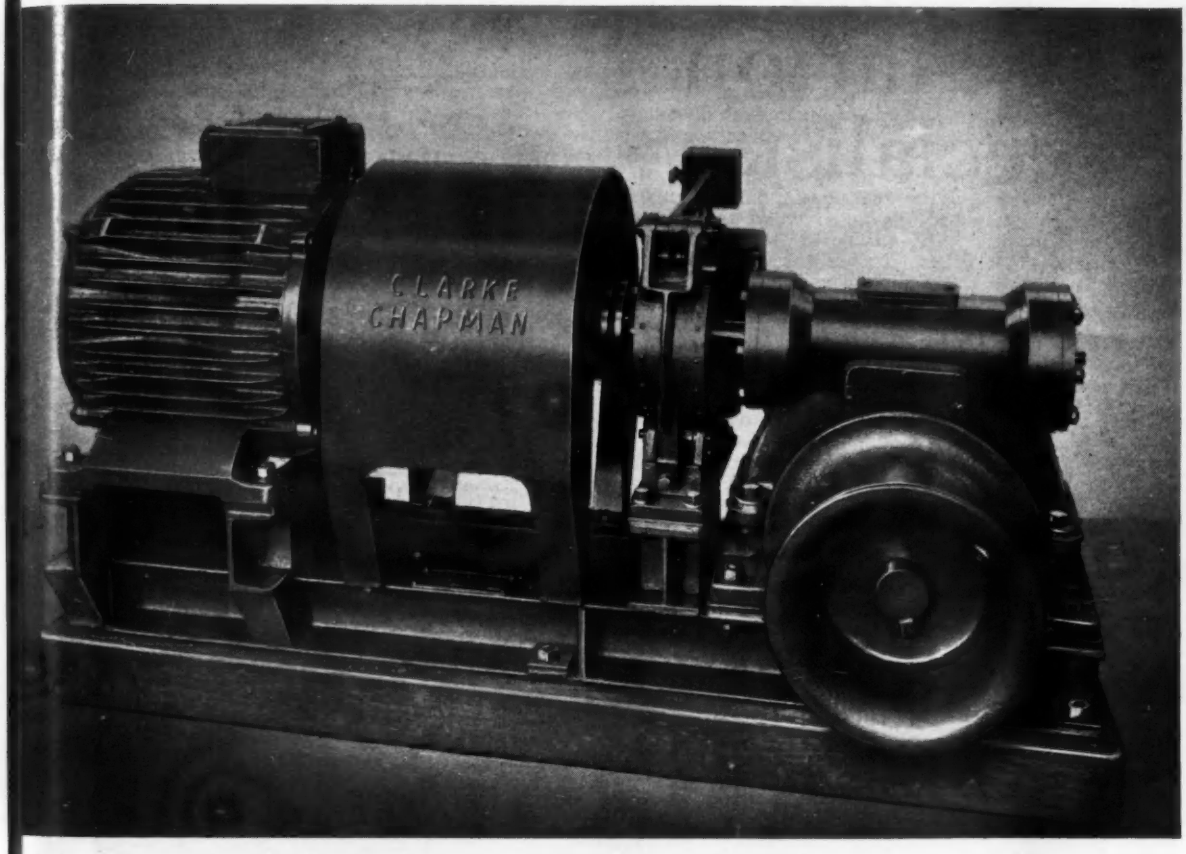
ROBERT M. DOUGLAS (CONTRACTORS) LTD.
395 GEORGE ROAD, BIRMINGHAM, 23
BRIDGE ROAD, WAUNARLWYDD, SWANSEA
LONDON OFFICE: 47 VICTORIA STREET, S.W.1. TEL: ABBEY 4077

CIVIL ENGINEERING · BUILDING

SITE INVESTIGATION · EXCAVATIONS · FOUNDATIONS · REINFORCED AND PRESTRESSED CONCRETE · FACTORIES · ROADS
BRIDGES · PILING · SEWERAGE · RAILWAYS · WATERWAYS · TUNNELS

Clarke Chapman

WINCHES FOR HANDLING RAILWAY WAGONS ON SITE AS SUPPLIED TO SWAN VILLAGE GAS WORKS.



SIX FAIRLEADS, fitted with roller bearings, were also supplied for rope diversion.

The winch illustrated is one of four supplied to the Swan Village Gas Works for handling railway wagons on site. Driven by a 22 H.P. squirrel cage motor at 720 r.p.m., the winch is arranged to exert a pull on the rope of 2 tons at 120 f.p.m.

Features of this worm-geared type winch include:—

- **Gears totally enclosed in oilbath.**
- **One warping end overhung on the side of the gearcase.**
- **Continuously running motor driving the gearing through a Vulcan traction-type fluid coupling.**
- **Post type weight operated brake, released by an electric thruster.**

CLARKE, CHAPMAN & COMPANY LIMITED.
Victoria Works - Gateshead 8 - Co. Durham.

TELEPHONE: GATESHEAD 72271 (10 LINES). TELEGRAMS: "CYCLOPS," GATESHEAD.

LONDON OFFICE: DUNSTER HOUSE, MARK LANE, E.C.3.

TELEPHONE: MINCING LANE 8345/6/7. TELEGRAMS: "CYCLOPS," EASPHONE, LONDON.

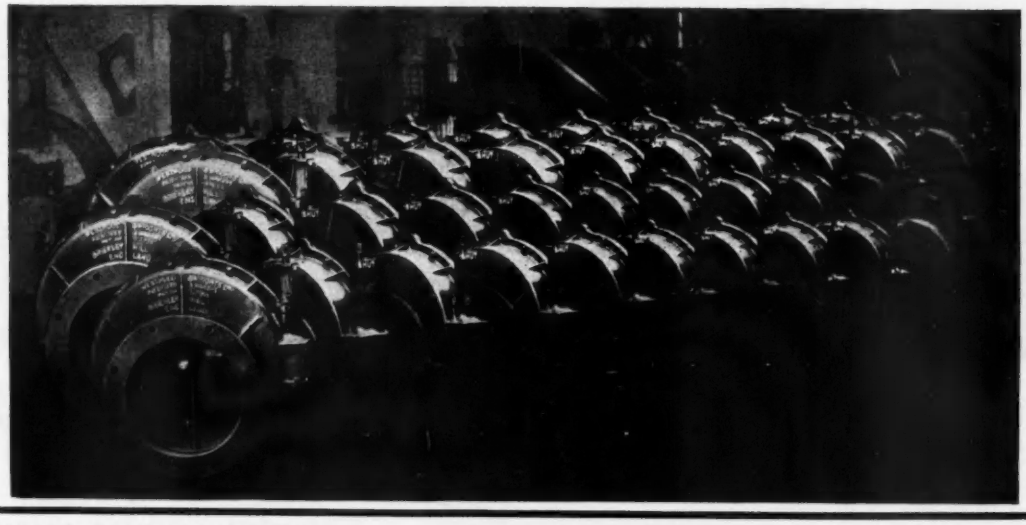
Thermal Insulation Specialists

High-class work of all descriptions carried out

ENQUIRIES INVITED

W. J. TRANTER LIMITED
TIBBINGTON WORKS, TIPTON, STAFFS
'Phone 1231-2 Tipton
'Grams " Titan, Tipton"

GAS VALVES AS USED AT SWAN VILLAGE GASWORKS



WESTWOOD & WRIGHTS LIMITED

ENGINEERS & CONTRACTORS · BRIERLEY HILL · STAFFS.

Telephone : Brierley-Hill 7751-4 (4 lines)

Telegrams : Westwood Wright, Brierley Hill

Fuel Usage in Great Britain

THE MELCHETT LECTURE GIVEN ON OCTOBER 7
TO THE INSTITUTE OF FUEL BY

HAROLD HARTLEY

C.B.E., D.Sc., Hon.M.Inst.Gas E., F.Inst.F., Chairman of Radiation Ltd.

FOR this Melchett Lecture it seemed incumbent on me to deal with matters within my direct experience. Since 1912 the greater part of my time has been occupied with the design, manufacture, sale and use of domestic appliances for space-heating, for cooking and for water-heating. In that period a considerable technical literature has been created and rather than deal with a particular aspect for the specialist, I have decided to make a number of comments, in the hope that these may give a picture of wider interest. The Address will end with some suggestions for reducing the present domestic waste of fuel.

The opening sentences of Chapter 5 of the Ridley Report state that nearly one-third of the coal mined in this country is used domestically, either as solid fuel or in the form of gas and electricity for providing warmth, cooking facilities, hot water or light. Over half of the capacity of gasworks and about one-third of the electricity generating system are required for meeting the domestic demand.

The domestic fuel usage in 1952, expressed as potential heat value, was roughly as follows:—

Coal burnt directly ..	10,500 mill. therms
Coke	850 mill. therms
Gas	1,350 mill. therms
Electricity	550 mill. therms
Oil and bottled gas ..	200 mill. therms

According to the latest issue of the Blue Book* the domestic expenditure on fuel in 1952 amounted to £438 mill., made up as to: coal £187 mill., electricity £103 mill., gas £103 mill., other £45 mill.

Eighty-two per cent. of households have a supply of electricity, while 78% have a supply of town gas, and two-thirds have supplies of both gas and electricity. Only 7% of households depend on solid-fuel apparatus alone—a significant fact.

The retail sales in 1952 of all types of domestic appliances for cooking, heating and hot-water supply are estimated to have yielded about £65 mill. and the manufacture and wholesale distribution to have resulted in the direct employment of some 45,000 to 50,000 people.

Accurate data are not available, but the total numbers of appliances in normal use are possibly of the following order:—

	Gas	*Electricity*	*Solid fuel*
Cookers ..	10½ mill.	2½ mill.	2½ mill.
Space-heaters ..	4½ mill.	12 mill.	12½ mill.
Water-heaters ..	2¼ mill.	2¼ mill.	1¾ mill.

In the above there are included some 300,000 domestic cooking appliances used with bottled gas, which is supplied in all to about 400,000 users.

EFFICACY AND USE OF APPLIANCES

The further the design of apparatus has been developed, the more difficult it is to make improvement. A time arrives when the limitations of existing methods of examining the problems prevent further progress and a radical change of approach becomes necessary. This stage has been reached with certain heat service equipment.

While progress by trial and error may continue for many years to come, the extent of this will lessen as experimental and industrial techniques improve and experience accumulates. It will be easier to eliminate guesswork when the objective is more clearly defined; the importance of a clear definition must be stressed because the evaluation of alternative technical policies has depended too much on individual judgement and on the continued acceptance of existing habits.

Improvements of details derive from experience in the making, selling and using of appliances, but radical advances can follow only from further study of the underlying principles involved. By operational research methods desirable standards for comfort, hygiene and gastronomy can be defined, and a substantial amount of work has been done in the heating sphere. Such studies are necessary for the developing of better types of heat service appliances, and, in so far as the results can be expressed numerically, they enable the technologist to define his technical and economic problems more clearly.

Space-Heating

The bulk of the domestic space-heating is done with solid fuel and it has been variously estimated that 98%* of 'main' living rooms are fitted with coal or coke burning appliances.

For bedrooms some 25% of the population appear to depend on gas or electricity for the occasional heating needed.

The adaptation of appliances for heating has been determined by the climatic conditions and by traditions. During the eighteenth century, with the expansion of ironfounding, a change was made from an earlier practice which has had a bad effect, and to which attention will be drawn later.

There is little public appreciation of the advantages of using convected heat. Central heating has found little application in the home, although it is a commonplace in countries with severer climates. Portal houses were provided with closeable solid-fuel fires with an easily controlled rate of burning, giving the advantage of reduced ventilation and the benefit of convected heat. These fires are more efficient than either the old or the modern type of grate, and their reception by the occupants raised hopes that they would sound the knell of the built-in open fire.

Little has been done to make known the advantages of using self-contained appliances giving radiant and convected heat, and progress has been hampered by the national housing policy. A big effort will be needed to break down public inertia and to make people realise that the ideal heating system is really one of which the room occupants are almost unaware. It is not one that has to be the focal point of the family circle and may limit the utility of the living space provided.

Heat Absorption by Chimneys

It is common knowledge that a substantial amount of heat is transmitted to the chimney by the flue gases passing away from an appliance. Little has been done, however, to estimate the temperature gradients and to take advantage of the fact. A year ago, in the William Young Memorial Lecture,† results were quoted of an examination made of the heat content of flue gases at different levels. The data obtained permit of calculation of the heat losses up to any level in the chimney. A picture of the general conditions existing is represented by Fig. 1.

* National Income and Expenditure 1946-52, published August, 1953 (H.M. Stationery Office).

* The Coal Utilisation Council has stated recently that this 98% is subdivided as to 67% open fires, 24% ranges or combination grates and 9% other types of apparatus.

† Annual General Meeting, Scottish Association of Gas Managers, September 11, 1952.

During the Middle Ages, when wood was the primary fuel, the fireplace often consisted of a recess, from the top of which a chimney led into the open air. The fire was built on the floor of the recess or in an open basket and re-radiation of heat from the surrounding walls made a substantial contribution to comfort. The use of coal as the source of domestic heat led ultimately to the modern practice of limiting the space provided for the fire itself, and of adding an ornamental but otherwise useless surround to close up the remainder of the fireplace recess. This restriction of space has seriously limited progress in the design and use of the solid-fuel fire, and has had a bad effect also on the design and use of the gas fire.

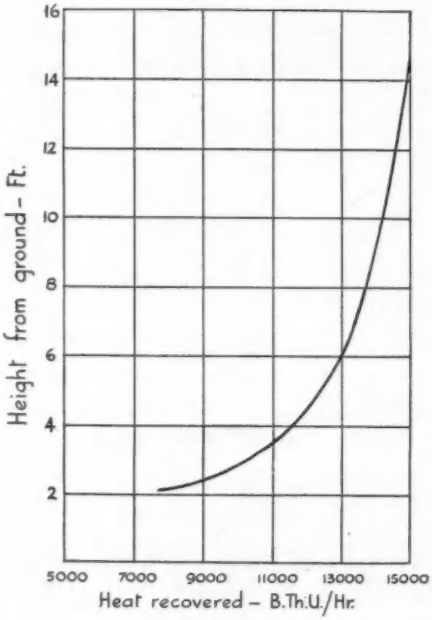


Fig. 1.

By making the fireplace a recess with a well-designed source of heat standing freely in the middle, a substantial improvement in efficiency is attainable without constructional complications (Fig. 2). Merely by standing an ordinary gas fire in such a recess the heat output would be increased by 20% or more in the form of convected heat. Such an arrangement was included in experimental houses designed and built in collaboration with D. E. E. Gibson in Coventry some years ago, and was also demonstrated to a large number of architects in a Midland factory. The provision of fireplace recesses would do much to enable better use to be made of solid fuel and gas for space-heating, and also encourage the early manufacture of self-contained apparatus in which bituminous coal could be burned smokelessly.

Free-Standing Fires

In 1939 A. F. Dufton described a simple form of solid-fuel fire, referred to as an adaptation of the Cheminée de Nancy, which he had made to improve the heating of a living room. The fire, which was placed in a typical recess, emitted both radiant and convected heat. With it he found the coal consumption could be reduced from 3 lb. to 2 lb. an hour. Recently, J. S. Hales has recommended the use of a similar type of fire, but with an adjustable flue restrictor and reduced grate area; the self-contained appliance to be designed for sealing to the top of the firebrick back of an existing built-in fire. The sealing may offer practical difficulties and if this is faulty the appliance will not be effective (Figs. 3 and 4). The proposal should be given a large-scale trial and every effort should be used to make it a success. The Ridley Committee has endorsed the suggsetion.

The use of such fires will act as a palliative, but their cost may be appreciably greater than that of low-cost grates. It will be influenced very much by the public demand, which has yet to be created. Whose is the responsibility to educate the public, and demonstrate to housing authorities the advantages of a change of fireplace design?

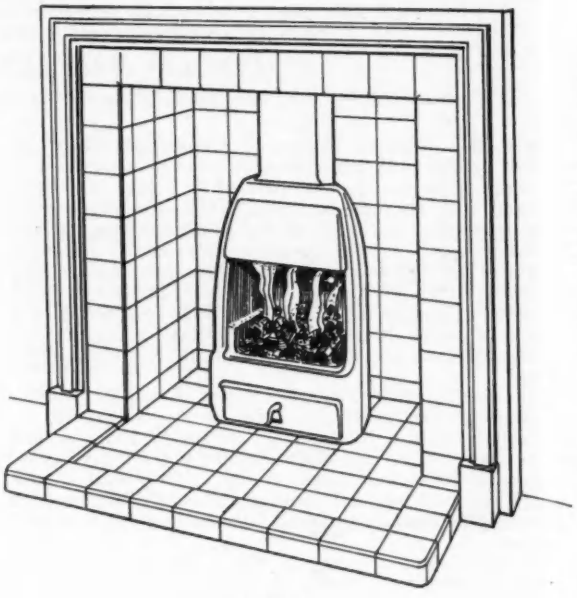


Fig. 2.

Radiant and Convected Heat

Although much has been published about the emission of heat from various types of apparatus, the value of the information is not always recognised. There is a failure to distinguish adequately between the effects of radiant and convected heat, and to analyse in detail the results attained with appliances providing the heat in one form or the other.

Some of the advantages of a source of radiant energy for the rapid attainment of comfortable conditions over a limited area have been known for many years. In 1925 Fishenden and Willgress published the results of experiments in which radiant intensities were determined corresponding to comfort conditions over a range of air temperatures. Further work has been done more recently by Bedford and others, but the significance of this body of knowledge has not always been recognised in planning some of the investigations which have been made.

In this country space-heating is most often discontinuous, and insufficient attention has been paid to the implications of intermittent usage of appliances. A helpful contribution is to be found in a recent paper by D. R. Wills, in which the variable nature of domestic heating needs is analysed in an informative manner.

Then again, there is need for a better appreciation of the significance of temperature variations throughout a room.

The efficacy of an appliance should be a measure of the ability to maintain with it the desired comfort conditions in the occupied parts of a room, and particularly up to, say, 4 ft. to 5 ft. from the floor. Dufton by his work probably came closer to a true evaluation of room heating efficiency than have some later workers. His method, which takes into account both the temperature distribution within the room and the effect of the rate of air change, has much to commend it.

Insulation and Ventilation

There is a growing appreciation of the importance of better structural insulation of houses and of the need to prevent excessive ventilation for maintaining comfortable conditions. The gains possible are well established, but there has been a delay in the application of the informa-

tion which is, from the technologist's point of view, common knowledge. This delay may be attributable to preoccupation with the initial cost of building, and to indifference to the factors affecting fuel usage.

The adoption of improved insulation appears to be more extensive in the northern half of England and in Scotland, but the proportion of new houses insulated to the Egerton standard is inadequate. It is understood that in the north about one-half of the houses now being built have ceiling insulation up to the Egerton standard. Somewhat over one-third have an improved outer-wall insulation, although not up to the Egerton standard, but practically all reach the Egerton standard of insulation at the ground level by the use of a solid floor.

Building Costs Reduced

Building costs have been reduced in some cases by the use of light-weight concrete blocks, which helped to offset the cost of ceiling insulation. By insulating a house to the Egerton standard, a reduction of 25% in heat losses from the structure can be effected, compared with those occurring in pre-war standard houses (11 in. cavity-brick outer walls, wood and joist ground floor, and tiled and felted roof).

Quite important economies can be obtained by reducing the effect of chimney pull, as is done in the most advanced form of convector gas fire with chimney-break attachment, and by reducing the amount of ventilation such as follows from the use of flue restrictors with solid-fuel-burning appliances. When an adjustable restrictor is provided in the flue outlet, it is suggested that an 'hygienic' test should be applied before approval of appliances, lest fatalities occur due to carbon monoxide poisoning when smokeless fuels are used. Such a test has been applied to the gas fire ever since W. R. Twigg made his recommendations some 40 years ago.

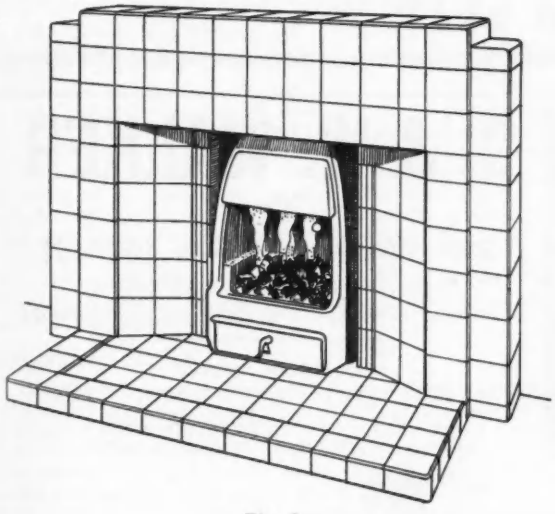


Fig. 3.

Smoke

In the section of the Ridley Report dealing with smoke abatement, three main sources of smoke pollution are quoted; the first is defined as:—

> 'The millions of houses which use raw coal burnt in old-fashioned open grates as the main source of heat comfort' . . . . 'producing a million tons of smoke (a year) . . . .'

The Ridley Report was published in September, 1952. In December of that year there followed the latest London fog disaster, which a writer in the *Lancet* described as 'a violent and untimely epidemic' which . . . . 'smote the people of London.'

It can be stated definitely that most of the technical problems associated with the burning of bituminous coal in the home, virtually without smoke production and at high overall efficiencies (70-80%), have been solved. Coal-burning domestic appliances with which such results are achieved have been marketed for some years. Up to the present the application has been made for the provision of whole-house heating and hot water. The principles used in the fire-pot construction can be applied to other domestic apparatus, which, however, may only be manufactured if a worth-while market becomes available.

COOKING

It is estimated that some 72% of the cooking load is carried at present by the gas industry, that some 17% of the load is dealt with by the electrical industry, and that approximately 15% of households use a solid-fuel appliance for cooking.

During the present century there has been a striking increase in the demand for gas and electric cookers, and the two industries compete keenly for the market. Published statistics show that the gas industry is maintaining a lead and that both gas and electricity have benefited at the expense of solid fuel.*

The competition for the load between the two younger industries has stimulated improvement in cooker design. Work on the solid-fuel cooker is now going on apace, but extension of the use of solid fuel for cooking is hindered by the absence of a suitable flue in many of the houses now being built. Solid fuel can be used most effectively in appliances designed to provide a combination of warmth, cooking facilities and hot water, and it would be better from the national standpoint to erect houses which make it easy for such equipment to be installed.

Higher Thermal Efficiency

There has been some raising of the thermal efficiency of gas and electric cookers during the last decade or so, but this has not been notable, and it would seem that no great improvement will be effected so long as traditional methods and utensils are used in the kitchen. The incidence of the cost of cooking on the weekly budget is small, and most attention is now paid to factors in the design which affect the efficacy and ease of operation of the appliances. More emphasis is now laid on minimising the work of the housewife in cleaning and maintaining the equipment and on simplifying the cooking procedure. The thermostat for the gas oven was first introduced in this country about 30 years ago and it is now an essential.

Care is taken to see that the external surfaces are kept cool, and that the working parts shall be maintained at as low a temperature as possible, to minimise charring following spillages during cooking.

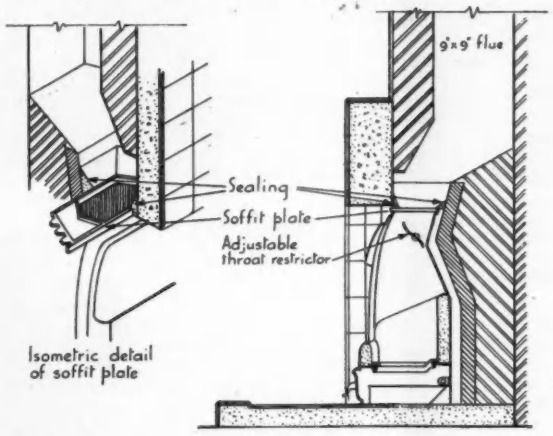


Fig. 4.

The designing of the electric cooker has followed much the same lines as that of the gas cooker, which from the earliest stages of its evolution has been adapted to suit traditional cooking operations. Both types satisfy

* During the 4 years 1949-1952 inclusive there were manufactured approximately 3 mill. gas cookers, 1 mill. electric cookers, and some 700,000 domestic solid-fuel cookers. Of the 165,000 domestic solid-fuel cookers produced in 1952, only about 75,000 were of the free-standing type.

(*Continued on p.* 137.)

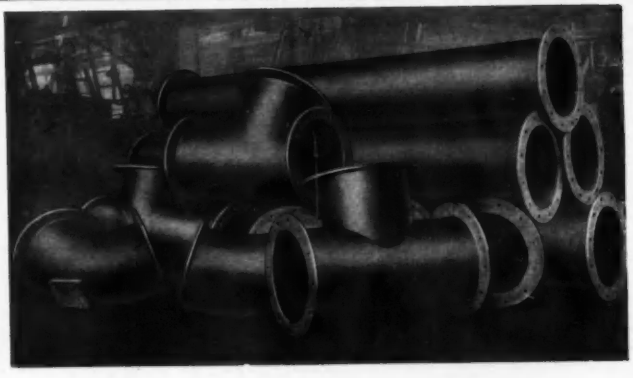
SAMUEL CUTLER & SONS LTD.

SPECIALISTS IN ALL TYPES OF GASWORKS PLANT
AND
STEEL CONSTRUCTIONAL WORK

70 VICTORIA STREET,
WESTMINSTER, S.W.1
Telephone: Tate Gallery 9592.
Telegrams: Retortus, Sowest, London.

LONDON

PROVIDENCE IRON WORKS
MILLWALL, E.14
Telephone: East 5231-2.
Telegrams: Cutler, Millwall, London.



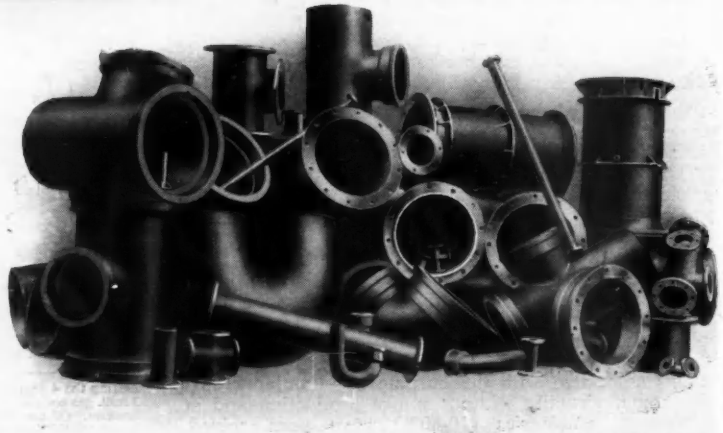
C. & W. WALKER LTD.

DONNINGTON, Nr. WELLINGTON—SHROPSHIRE
'Phone: 12, WELLINGTON—SHROPSHIRE.
'Grams: "FORTRESS" DONNINGTON—SHROPSHIRE

LONDON OFFICE:
70, VICTORIA STREET, S.W.1
'Phone: 5842 LONDON—VICTORIA
'Grams: "FORTRESS" SOWEST, LONDON

ELECTRICALLY-WELDED
STEEL PIPES
AND
SPECIALS

CAST IRON
PIPES
AND
SPECIALS



standards which from the technical, production, and utilisation standpoints are high, and from whatever point of view the appliances are examined they will be found to compare favourably at least with any other types of domestic apparatus.

The utilisation sides of the gas and electrical industries are well developed technically, and in the technical Press much space is given to consideration of domestic appliances. In view of the importance of the cooking load, it is surprising that more attention has not been given to the rational development of the cooking process. The technical literature contains little in the way of considered treatment of the use of gas or electricity for cooking, and the incidental mention of the subject in papers covering a wider field is at times somewhat superficial.

A Fundamental Approach

For progress in the future an approach to the problems of cookery should be made at a more fundamental level. Despite all the knowledge that exists of the chemistry of proteins, fats and carbohydrates, the compilation of cookery recipes is still quite empirical. The chief difficulty arises from the fact that the physics and chemistry of the processes of food assimilation by the body are complex, and the correlation between nourishment and palatableness is by no means perfect. Even the relatively limited studies that have been made have shown that the objectives of cookery cannot be expressed fully in ordinary gastronomic terms, owing to the existence of ancillary food factors to which the palate is unresponsive. It is not surprising that divergent views are still held as to what constitutes a well-balanced diet.

The way in which heat is transferred to materials of low conductivity such as foodstuffs is complicated, and the development of the art of cooking will depend on well-ordered empirical inquiry, as little progress has been made in defining principles which will explain the results of experiments. Enough is known, however, to suggest the possibility of improvements in appliance design if certain traditional practices can be modified.

Not only can the type of result be varied permissibly over a much wider range than is envisaged in the usual cookery book, but in addition there is a considerable latitude in the means which may be used to obtain it. Cooking is a function of time and temperature, but a number of other factors also affect the quality of the food and the speed and economy with which the desired results can be obtained. These are such factors as increase in pressure, variation in the extent to which the heating is done by radiant or convected heat, or changes in the ambient atmosphere in oven operations.

Laboratory Studies

Laboratory studies of cooking operations, and an examination of the acceptability of the results of non-traditional processes, do suggest that a basis can be found for breaking away from the present conventional methods. For example, it has been the practice in the past to roast meat at relatively high temperatures, whereas experience both here and in America has shown that more satisfactory results are obtained if the cooking is done for a somewhat longer period at a lower effective temperature.

It is necessary to consider appearance, palatableness and digestibility, but it is important to know also what are the cumulative effects of the food-processing method. It can be seen that a joint roasted in a gas oven differs in appearance from one roasted in an electric or a solid-fuel oven; the sapid substance on the outside of the joint is somewhat redder and more attractive-looking. This is due to the presence of nitroxy-haemoglobin formed by the action of the traces of oxide of nitrogen in the combustion products. It is the same substance which is responsible for the reddish colour of corned beef, produced during immersion in a solution of nitre containing minute traces of nitrite. Haldane showed many years ago that the substance passes through the human system unaltered.

It has been suggested quite recently that if, when frying, the fats become overheated, carcinogenic bodies may be produced. Such a result would be a consequence of the time/temperature treatment, but not necessarily a characteristic of the appliance on which the operation was performed. It would be possible in the case of gas or electric cookers to avoid such overheating by thermostatic control. Such a refinement would add appreciably to the cost of the apparatus. The physiologists have not yet proved the thesis, which, no doubt, is still the subject of investigation. It will be realised, however, that the research staffs of appliance makers must take note of such a possibility, as the manufacturers and the industries supplying the fuels have a moral responsibility to safeguard the welfare of the public so far as lies in their power.

WATER HEATING

Of recent years more interest has been shown in the use of hot water and water heating appliances. The surveys made have, however, been on a relatively small scale and, although arranged thoughtfully to make them representative, it is perhaps not surprising that the results reported do not always agree. Taken together, they show a serious lack of adequate washing and bathing facilities for the community. Five surveys were planned by the Social Survey Panel, and the data collected have been issued in two special reports (Nos. 8 and 14 in the National Building Studies Series).* Together they probably contain the most comprehensive information available about domestic hot water supplies in Great Britain. They assess the distribution of appliances, the use made of various types, and the amount of hot water used.*

These vary considerably with the nature of the district, the region, the size of the income, the age of the building and the type of dwelling.

Almost two-thirds of households use less hot water than the recommended Egerton standard of 250 gal. a week.* The main reason is, no doubt, economic in so far as the consumption depends on the cost of such capital items as baths, and water heating equipment and its installation, and also on the cost per gallon of hot water.

The demand for better supplies of hot water will grow, and may ultimately result in quite a large percentage increase, but there is a gap in our knowledge of the effect of the cost of providing the service on the level of utilisation.

Market Surveys

One of the shortcomings of market surveys is in the assessment of users' reactions to improved methods of achieving the desired result. The majority of housewives have a very limited experience of alternative types of water heating appliances and systems, and their reactions are based largely on hearsay, or on impressions derived from reading *ex parte* statements in advertisements and in the popular Press. The attainment of reasonable standards of accuracy in such inquiries is admittedly difficult, but the extended use of operational research techniques could give a better assessment of the situation, and provide data less affected by the prejudices and background of the individual.

There is a wide range of water-heating appliances available to the public. With the exception of the gas-operated instantaneous heater, all other systems depend on storage. The use of any system involves heat losses, which may be significant.

The efficiency of transfer of heat is greatest with the electric immersion heater and least with the solid-fuel 'boiler.' In all cases problems arise due to the nature of the water itself; scaling with hard waters, and corrosion with peaty waters. By treating the water supply with hexametaphosphate, scaling troubles can be avoided, and there is now a considerable experience which enables soft waters to be dealt with satisfactorily.

---

* Published by H.M. Stationery Office.

† It is worth noting that 7% of the households surveyed (nearly 6,000) had no piped supply of water, the percentage being higher in the rural and lower in the urban areas. 46% had their own bathroom, 8% shared a bathroom, and 12% had not even a portable bath. 15% of the households had no water-heating appliances, while a further 28% had only a copper.

The Coal Utilisation Council, following its survey, reports as follows: 'In winter 47% of families get their hot water from solid fuel, 44% from gas and 9% from electricity. 31% of the "main" room appliances have back-boilers for hot-water supply.'

The gas and electrical industries are much interested in the water-heating load,* which could be of great value; it is potentially twice as valuable as the cooking load.

A special preoccupation of the gas industry has been the cost of maintenance, resulting in part from the corrosive effect of condensate which is subsequently evaporated *in situ*. With the gas circulator this can be overcome by the use of chromium-nickel-molybdenum steel for the combustion chamber. Gum trouble is avoided by the use of suitable filters in the gas stream. The maintenance problems have been solved with the circulator and the sink storage heater.

Thermostatic control makes gas and electric storage water heaters virtually automatic in operation. With solid-fuel 'boilers' such control minimises the danger of accidental extinction of the fire and reduces the work to that of refuelling and ash removal.

It is not difficult to attain a high efficiency of transfer of energy from the burning fuel to the water whichever fuel is used. The winning of a water-heating load by the individual fuel industries will be much influenced by considerations of relative cost, ease of operation and reliability of the service obtained.

APPLIANCE DESIGN AND MANUFACTURE

In 1907 the Institution of Gas Engineers, in co-operation with Leeds University, formed a Committee to recommend a method for measuring the radiant efficiency of the gas fire. The work done by E. W. (now Sir Ernest) Smith resulted in the Leeds test, which forms the basis of most of the improved methods since proposed for such measurements.

The work of this Committee has had a far-reaching effect; in the first instance directly on the designing of gas appliances, but subsequently on the manufacturing methods used and on the standards of production maintained. Gas appliance manufacturers appointed to their staffs scientifically trained men with a knowledge of combustion, men who were primarily physical chemists. Their first task was to assess the merits of the goods that were manufactured and to devise means for their improvement. At the same time they had to familiarise themselves with the technology of the production processes in use. As appreciation grew of the value of the help they could provide, their work began to have a direct effect on production techniques. They functioned not only as inventors, but as guardians of the standards of performance. If their efforts were to succeed, and the organisations they served were to benefit to the full, it was essential that they received full support. Today their part in the hierarchy of the industry is established.

This practice, which originated in gas appliance design and manufacture, has spread to other fields of fuel utilisation in the home. Today a number of appliance manufacturers maintain research and development departments, and also employ technicians for the control and improving of production methods.

In the organisation with which I am associated the work of the Central Laboratory affects the whole of the Group. It has, for example, a responsibility to devise or collate new ideas which can be applied in the designing and manufacture of better apparatus. It is the spearhead of the Group's design policy, and new designs are based on investigations, carried out in the laboratory. On the staff are physicists, chemists, metallurgists, biochemists, engineers, and other technologists. The work of the technical section is divided into three classes:—

(1) *Background Research.* — This work is done to obtain a better understanding of gaseous and solid-fuel combustion, of heat generation and transfer problems, and of the effects produced with apparatus intended for space-heating, for cooking and for water-heating.

(2) *Applied Research.*—This work is done with parts of apparatus or complete appliances. New concepts are applied in working models prepared for examination by other specialists. It is at this stage that the mechanics of the appliance design are considered so that production shall be as simple as may seem possible. It is at this stage also that the apparatus is examined in the light of B.S. Specifications or other standards which it is desired to attain.

(3) *Process Research.*—This work is concerned with improving our knowledge of the technique of works processes and of the uses of new materials.

While the design policy is the responsibility of the Board of the Company, it is carried out by teams of specialists able to look after the needs of the development, production, and sales sides of the organisation.

Just as with design, so in manufacturing methods there has been a marked change, resulting in the adoption of mass production and specialisation with their economic gains.

In the foundry there is no longer complete dependence on the moulder and his skill, as mechanised plants are used to provide the bulk of the output of castings, although this is a decreasing quantity. The working of the cupola and the preparation of the sand are both under technical control. Effort is directed to the manufacture of a uniform product, intelligently designed for the use to which it is to be put.

The tool rooms and press shops are equipped with up-to-date plant operated under the control of experts.

The enamelling departments are mechanised. The enamel is applied with automatic sprayers to moving lines of goods *en route* to the driers and the furnaces. The box muffles have been replaced with continuous furnaces. The preparation and the use of the slurries are controlled by technicians, as is the working of the plant itself.

The enamel frits are manufactured in a factory designed to eliminate the danger of silicosis. This factory is equipped with all the necessary accessories for the handling of raw materials, weighing, mixing and fusing the batches, and checking and spraying the product.

Mass Production and Specialisation

Before nationalisation of the gas industry a large number of variants of products were needed to satisfy the whims of customers. Today most of these have been eliminated; such as now remain are of secondary importance from the production standpoint. The introduction of mass production and specialisation has been of considerable benefit to the gas-using public. Manufacturers are able to provide for those who must buy in the low-price market, cookers with a finish and standard of performance higher than were available for the high-price market 15 years ago. The significance of this change is perhaps not fully appreciated by the electrical industry, and may not have come within the range of thinking of the coal industry.

A 'utility' convector solid-fuel grate, of the type referred to earlier, may cost about £8 if the demand is small. On the other hand, if a single manufacturing unit were to make, say, half-a-million of these fires at the rate of 5,000 or more a week, the design could be adapted for mass production and the price would be reduced by at least one-third.

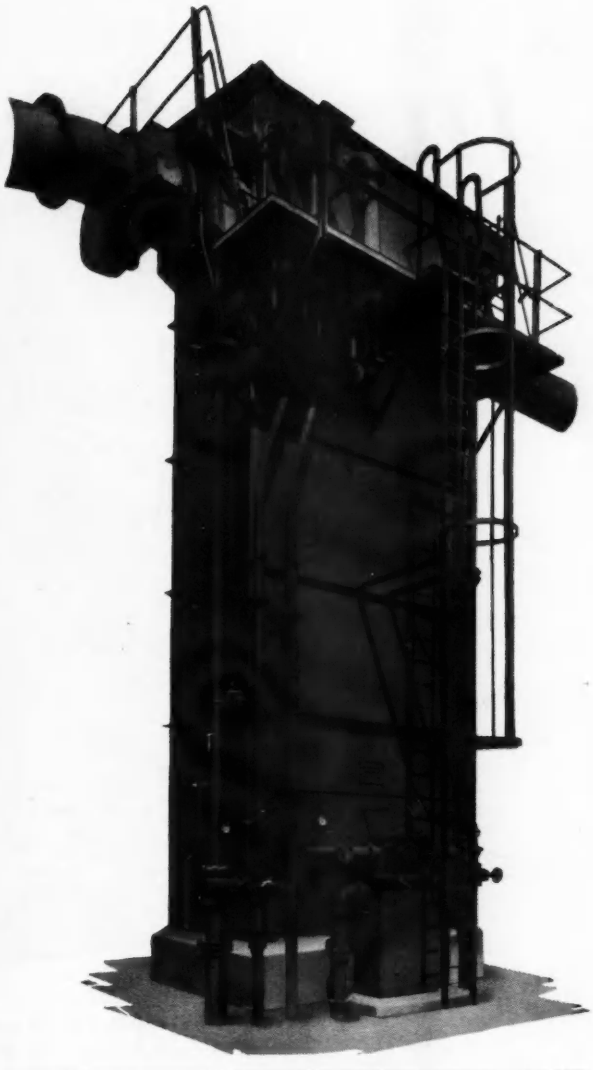
The production of the best appliance factories in Great Britain compares favourably with that of any other country.

(To be continued)

* In Report No. 14 the average weekly consumption of hot water at 140°F for households of four persons is summarised as follows:—

	Percentage of households	Equivalent gal. per week at 140°F.
No appliance	about 15	less than 100
Copper only	nearly 30	130
Gas and electrical appliances (no solid fuel)	about 20	150
Solid-fuel appliances (fires with ovens and independent boilers, 270; inset fires, 140)	nearly 35	250
Hot water laid on (direct supply)	about 1	450
Hot water laid on (calorifiers)		350

† According to the Statistical Digest, in the four years 1949-1952 about 684,000 gas-operated water heaters and 970,000 electric immersion and electric storage heaters, up to 30-gallon capacity, were manufactured.



Modern gas condensing and washing plant is designed for high efficiency in operation, and incorporates the latest technical advances. In recent years we have carried out numerous contracts of this nature, and our experience enables us confidently to invite enquiries for all sizes and types of Condensing Plant and Static Type Gas Scrubbers.

Illustrated is one of three Mild Steel Vertical Water Tube Condensers installed at New Wortley Gas Works, Leeds, for the North Eastern Gas Board, each having a capacity of 3 mill. cu. ft. per day.

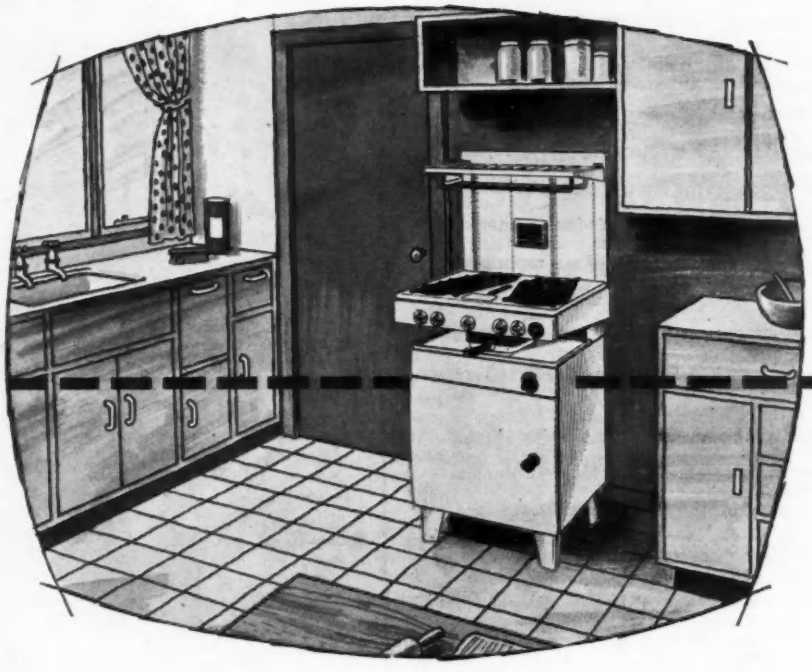
DE
DEMPSTER • ELLAND
1855 - 1953

One of our recent developments is the Labyrinth type Condenser which is especially suitable for large capacities and embodies the inherent advantages of both horizontal and vertical types :-
Reduced cooling surface, Increased rate of heat transfer, Accessible tubes, High water velocity.

TECHNICAL PROGRESS

ROBERT DEMPSTER & SONS LTD. ELLAND, YORKS.
LONDON OFFICE: 57, TUFTON STREET, WESTMINSTER, S.W.1.

In a class by itself



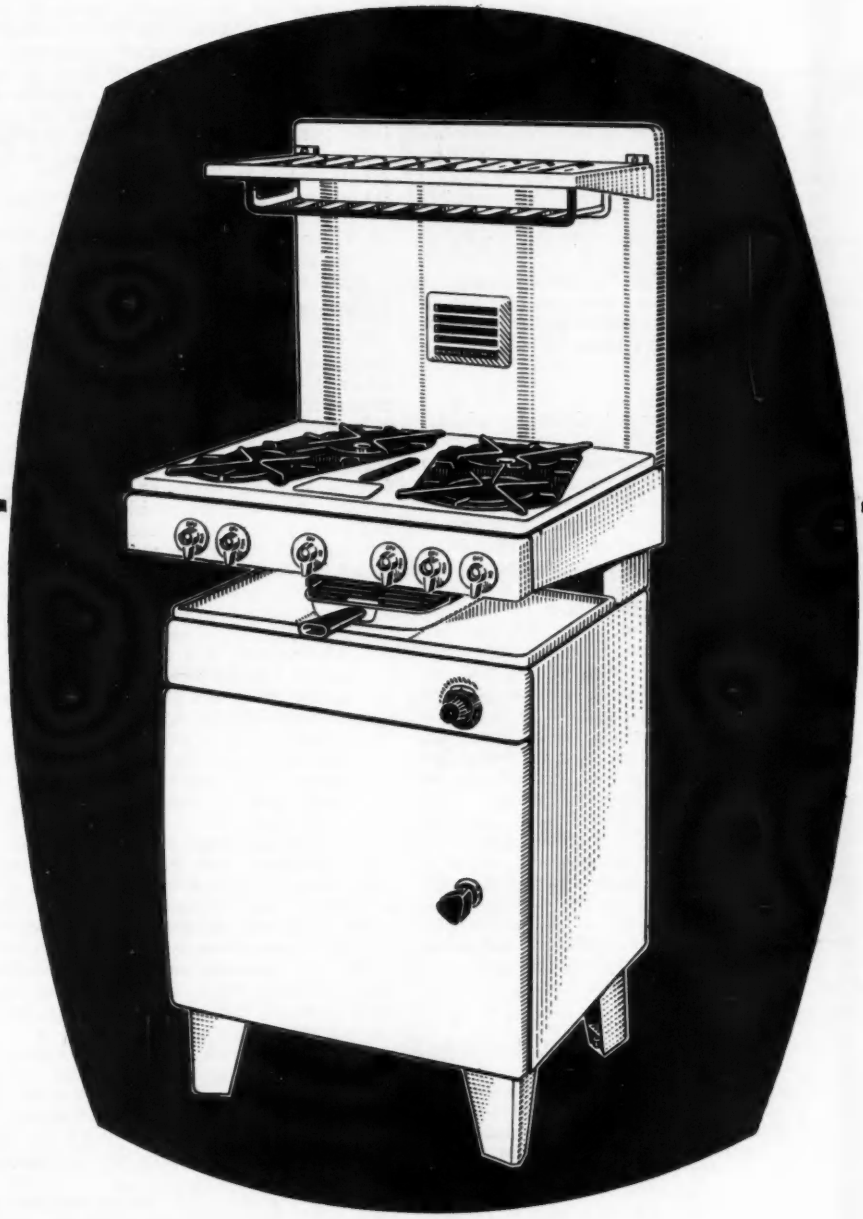
When a thing looks right it usually is right,
and that goes for the NEW WORLD EIGHTY FOUR

The NEW WORLD EIGHTY FOUR is designed for the job—handsome without frills, with nothing to go wrong—and beautifully made, it is a cooker you can particularly recommend to those of your customers who really *do* appreciate quality.

Now available in white, in addition to two tone cream and green and cream.

Radiation Group Sales Ltd.

NEW WORLD NEW WORLD NEW WORLD



7 Stratford Place, London, W.1 Telephone: MAYfair 6462

NEW WORLD NEW WORLD NEW WORLD

CREATING GOODWILL

AN ADDRESS TO THE YORKSHIRE JUNIOR GAS ASSOCIATION BY

J. G. TILLEY,

M.Inst.Gas E., M.Inst.F., General Manager, Huddersfield-Halifax Group, North Eastern Gas Board

IN any assessment of the position today it is necessary to bear in mind that, while we are as an industry some 150 years of age, our present form of organisation is only 4½ years old. When we were nationalised the leaders of the industry made a forecast that inevitably it would be a considerable time before we could hope to have everything running smoothly and before our ultimate design could be achieved. This has proved to be correct. While much has been accomplished we have a long way to go in our development.

Costs are a fundamental consideration in any organisation, though critics would have us believe that a nationalised industry is an exception to this rule. Statements as to our disregard of economic principles are made with such regularity that there is some danger, on the basis of the 'Hitler technique,' that even our own people not in possession of the true facts may begin to think that there is some justification for the public's idea.

Constant Scrutiny

Let me assure you that management places the highest possible importance on all costs and that the figures are subject to constant scrutiny and attention. Through no fault of their own, all boards have the basic disadvantage of having come into being at a time of monetary inflation. Capital charges, wages and salaries, and costs of materials have all risen considerably, and, as in other industries, these charges have to be passed on to the consumer.

In addition to these basic increases in costs of which you are all aware, there are other difficulties of the type which are not necessarily so apparent. For example, due to the general growth of towns, new housing estates are very often at the extremity of our distribution systems. The estates themselves have often been planned to give tenants a reasonable amount of space around their houses and while this arrangement has much to commend it, inevitably it means extra cost to us because of the added length of the mains and services involved, particularly, as so frequently occurs, where the incidence of the load makes it necessary to install a trunk feeder main. It now costs on average approximately £40 per house to supply mains, services, and meters to these estates, and, unfortunately, in many cases we do not obtain added consumption due to the fact that there has been a transfer of a portion of the population from one part of the town to another. What we gain on the new estates we may lose elsewhere. In other words, we frequently have to pay approximately £40 per consumer to retain existing business.

Disproportionate Increases

Added to this we have had to face disproportionate increases in the cost of our basic raw material—*i.e.*, coal—due to the Coal Board's revised system of evaluating coals, which has resulted in a steeper increase for gas coals as compared with those coals used for generating electricity. Steady expansion of sales has been a very useful factor over the war and immediate post-war period in keeping down the price of gas due to the spreading of overhead charges, but in the last few years, due to various reasons, the rate of expansion has not been all we would wish; hence we have not had much benefit from this factor.

We have, however, now had sufficient time since vesting date to obtain some financial advantages. The price of gas paid by the consumer has not risen by as large a percentage as the cost of wages, materials, etc., the difference representing the measure of economy obtained. To quote one example only, the cost of producing gas can generally be taken as being in inverse ratio to the size of the works. However efficiently a small works is run it cannot normally produce gas as cheaply as a large one. South of Huddersfield six works have now been closed down and fed with gas from the Huddersfield sub-grid. To complete the scheme there is one further works which will shortly cease production, and although these works are small, or relatively so, the combined production is such that it is estimated that, notwithstanding capital and compression charges, we shall save £29,000 per annum. Results to date indicate that the saving may even be larger than estimated.

Nevertheless, the price of gas has risen and this has produced two main effects:—

(1) We have now lost some of the price advantage we had over our competitors

(2) There has been a marked public reaction allocating the blame unjustly on nationalisation.

What, therefore, can be done to meet this state of affairs?

Comparative Costs

I need not elaborate on the first heading of comparative costs as the position is well known. Clearly it is much easier to sell a gas cooker, water heater, etc., to the average consumer when it can be shown that the cost of operation is less than that of a similar electrical appliance. In the absence of such a factor, or if the price differential is reduced, it becomes necessary to concentrate on other factors, in other words to develop fully the technique of selling. As I see the position, therefore, it becomes more and more necessary to develop our sales organisations and to train and encourage our personnel in the art of salesmanship. By this I do not mean the introduction of the high-pressure type of salesman who pushes an appliance on to a consumer irrespective of whether or not it will do the job. Equally I am very well aware that there is a school of thought that regards only technical men as being capable of dealing with consumers. There is, however, a middle course, and I personally feel that it is the one to pursue, with proper 'follow up' of all enquiries, plus canvassing.

Apart from developing our sales technique we have obviously to make every possible economy in all our costs, and such economies would appear to fall under two very broad headings:—

(*a*) Taking advantage to the full of the common ownership that has resulted from the area board structure.

(*b*) By the application of new methods and techniques and use of new materials in the place of those which have hitherto been regarded as traditional.

There is no doubt that economies can be obtained as a result of our present method of group or divisional working, and really there is nothing new here, in that there were prior to vesting date examples in existence of this method of operation. Centralisation of production does not represent the only economy. Others can undoubtedly be obtained by the standardisation of appropriate plant and equipment, by the introduction of modern stock control methods, mechanised accountancy, etc. Obviously, however, it is vital to ensure that every scheme is properly investigated to ascertain before it is started whether it will pay.

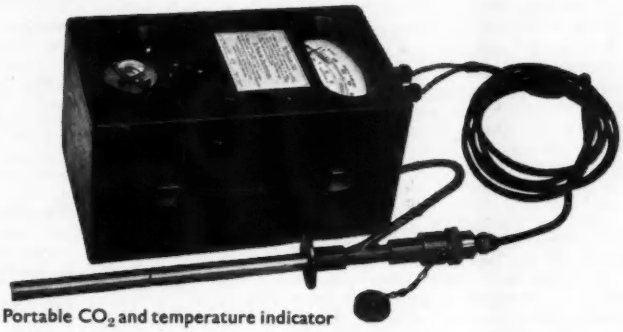
Throughout all this there emerges the problem of personnel. Inevitably such changes are not always popular because they so often result in some diminution of the responsibilities of the official at local level. This is a personal reaction and requires treatment as such.

Public Reaction

Perhaps one of our greatest problems as an industry is the attitude taken by the public. It has become the fashion to criticise the nationalised industries, normally without any justification or real knowledge of the facts, and the public have been only too ready to seize on increases in the price of gas as an example of alleged inefficiency. Let us, therefore, get this increase in price in its true

FUEL SAVING

THE recently published Report of the British Productivity Council on FUEL CONSERVATION stresses the enormous wastage of fuel in industrial plants in this country, and emphasizes the urgent need—and the possibilities—of greatly increased efficiency in the use of fuel.



Portable CO_2 and temperature indicator

Our new leaflet—"THIS BURNING QUESTION" deals with this problem and with the help our widespread organisation can give to every industrial user of fuel.

May we send you our
NEW LEAFLET D ?

CAMBRIDGE
INSTRUMENT CO. LTD.
13 GROSVENOR PLACE, LONDON, S.W.1
WORKS: LONDON & CAMBRIDGE

perspective. When we take out comparisons in costs over the pre-war days, we find that, whereas the price of coal has advanced by approximately 200% and labour costs by 140%, the majority of our domestic consumers are paying considerably less than 100% extra.

The fact that we are a public body does not in the slightest alter the position that we are essentially a commercial enterprise.

If we are to obtain the best results, to give the best service, it is essential to have the right people, properly trained in all the various posts throughout our industry. It is not sufficient merely to have good men at the top. The quality must be of a high standard at all levels.

The Gas Act lays upon each area board the duty of making provision for advancing the skill of persons employed. Arrangements to implement this requirement are generally well in hand and encouragement is given for training in the particular aspect applicable to the individual concerned, or by refresher courses for various grades of employee engaged on manual duties.

The implementation of this training, however, is by no means easy. The absence of personnel on courses or at classes often produces many complications for those responsible for getting work done and it would not, I suggest, be an unreasonable reflection on the part of those participating in the education scheme that here is a facility that is not always available in industry generally. One hopes, therefore, that the persons concerned will take full advantage of these opportunities to the benefit of both themselves and their board.

Industrial Relations Conference

AN important experiment in industrial relations will take place towards the end of this month at Southport when representatives of the manual workers and staffs of the North Western Gas Board will meet Board members and top management in a conference at which the Board's policies will be freely discussed in open forum. Mr. D. P. Welman told a Press conference this in London on October 8.

Two hundred and eighty manual workers who sit on works committees throughout the Board's area will attend the conference, and from the committees representing staffs there will be more than 100 delegates.

The Ministry of Fuel and Power, the Gas Council, and the T.U.C. will be represented at the conference, and Mr. Welman said he hoped several distinguished guests, including Mr. Tom Williamson, General Secretary of the National Union of General and Municipal Workers, would attend.

Mr. Welman said this would be the first large scale meeting of the kind in this country's gas industry 'and probably in any industry.'

Later, when describing the form the conference would take, he said: 'We are starting with a reception given by the Mayor and Corporation in the Floral Hall, where there will be a dance immediately after, and to that all the members of the works committees and staff committees are invited to bring their women-folk. It is not a spree. It is an opportunity to get all the people representing different branches from all the areas, from all grades, from the manual worker to people on the staff side to see one another, other than on duty.'

After that, the main purpose of the conference was to promote discussion out of which would arise mutual interest. On the day after the reception, there would be two papers read to the conference. The first would explain what the Board has done and its plans for the future, and the other would describe the measures already taken and proposed for organising, training and educating in an integrated way.

On the last day, Mr. Welman said he hoped Mr. Tom Williamson would address the conference. There would be other interesting speakers on general subjects followed by an address by himself.

'The most important thing on that Saturday morning is the opening of the conference to free question on any matter other than matters which are appropriate to the union machinery.'

Midland Juniors Resume Activities

THE average attendance at a first-of-the session meeting of the Midland Junior Gas Association is in the region of 60. The fact that on October 6 well over 100 members were present is a compliment to Mr. J. A. Tomes, who was inducted as President on that occasion. Personally expressed good wishes and written congratulations combined to get his first hours of office off to an encouraging start.

Mr. D. J. WARD, the retiring President, occupied the chair when the meeting opened. It was, he said, a sad thought that his term of office was at an end, since he could say with all honesty that he had enjoyed every minute of it. He thought that the past session had been a successful one and for this he was grateful to the members of the Committee who had given him valuable guidance and support, and particularly to their Hon. Secretary, Mr. H. J. Reynolds, who, as always, had been a tower of strength. Throughout the session attendances had been good and membership had increased.

Introducing Mr. Tomes, Mr. Ward said he had not only been a member for a long time, but his participation in the Association's activities had been notable for its keenness. The author of several papers, Mr. Tomes was in the unique position of having won the Institution bronze medal in 1943 and the Milbourne prize 1942/43. He wished him every success in his year of office.

Mr. WARD then transferred his medal of office to Mr. Tomes who, as his first duty as President, responded by presenting Mr. Ward with the past-president's badge.

Mr. TOMES then read his Presidential Address, the theme of which was 'Future Trends in the Gas Industry.' The address will be published in a later issue.

Mr. F. H. BATE (Wolverhampton Division), moving a vote of thanks to Mr. Tomes, pointed out that although Mr. Tomes was the author of several papers, he was also a good practical man. On one occasion at Stourbridge they had had some trouble, and he had never seen anyone improve matters more quickly anywhere. Mr. Tomes had undertaken experiments at the works and as a result the capacity of the works had been improved by 40%. The bulk of the address had been concerned with gas manufacture, but he thought they should also know the great service to the glass industry which Mr. Tomes had performed at Stourbridge and the respect in which he was held by that industry. Although it was customary not to discuss a presidential address, he could not help disagreeing with Mr. Tomes's reference to the 'Indian Summer' of the industry being past. When one noted that Europe used some 5 cu.ft. of manufactured and natural gas per person per day whereas U.S.A. consumed some 77 cu.ft. it was clear that we had yet to reach our peak.

Mr. TOMES, responding, said that if we all looked round quietly and took sensible stock of things, it must be recognised that the day of the conventional plant was past; we had not really progressed so very much since Murdoch's day. The whole future, however, would be bound up with specialisation.

Before members were entertained to light refreshments, Mr. W. MACNAUGHTON, Chairman of the Midland Section of the Institution of Gas Engineers, announced that he had, a few hours earlier, left Mr. J. T. Haynes, President of the Institution, who had asked him to convey to Mr. Tomes his personal congratulations and good wishes for his term of office. Mr. Macnaughton said that he envied Mr. Tomes his position, for he had many happy memories of when he had occupied the same chair 21 years ago.

Yorkshire Juniors' Annual Meeting

THE annual general meeting of the Yorkshire Junior Gas Association was held in Leeds on October 3, when members were addressed by Mr. J. G. Tilley, Group General Manager, Huddersfield-Halifax Group. A summary of Mr. Tilley's address appears on p. 142.

The following officers were elected for the ensuing year:—*President:* Mr. A. Cole. *Vice-President:* Mr. D. C. Henderson. *Junior Vice-President:* Mr. G. E. Banks. *Hon. Secretary and Treasurer:* Mr. I. Marshall. *Assistant Secretary and Treasurer:* Mr. K. G. Ogden.

An amendment to Rule 4 governing membership of the Association was carried. This allows, subject to the discretion of the Council, members of the Institution of Gas Engineers employed by gas plant and equipment manufacturers with works situated within the area of the Association to be admitted to full membership.

During the meeting presentations for papers given during the past year were made as follows:—

Clayton Award: W. F. Blakeley, for his paper, 'Electricity in Modern Gasworks Practice.'

Clapham Award: R. W. Deans, for his paper, 'The Value of the Space Heating Load.'

Firth Prize: D. Thomas, for his short paper, 'Spent and Part Spent Oxides.'

The following members were elected as a result of the ballot:—*Council:* R. H. Anderson, J. Edgar, E. Burkett. *District Education Committee:* R. E. White, A. Wilkinson, A. Cole. *County Advisory Council for Further Education:* G. Griffiths, A. Cole.

Scottish Gas Board's New Projects

PROJECTS involving expenditure of £1,000 and over approved by the Scottish Gas Board during July and August this year, totalled £586,883. The highest figure, £258,962, was for the Glasgow district. In the South West Division, projects over £1,000 totalled £173,469. In the Edinburgh Division, which includes the Newtongrange district, the figure was £39,531.

Details were given on October 2 by Mr. A. T. Morrison, Aberdeen, when he presided at a meeting of the Scottish Gas Consultative Council in Edinburgh. The summary of projects showed that the revised estimate of cost of linking and improving gas mains in Edinburgh, Musselburgh, and Prestonpans was £98,200, an increase of £19,420 over the expenditure authorised in 1950. It is expected that the work will be undertaken this year.

Schemes in Fife amount to £35,000, which includes £6,244 for coal handling plant at Kirkcaldy, £1,723 for retort repairs there, and £12,088 for mains replacement, etc., at Lochgelly.

The meeting at which these figures were reported also had some discussion on publicity for gas. In answer to a question Mr. Morrison said that the matter of what could be expended on advertising had been very much restricted by the Minister. That applied to both gas and electricity. There had recently been some relaxation, and the Gas Council was considering proposals. It was likely that there might be film shows for the public and a campaign in the National Press. The Scottish Board would have a certain amount allocated for advertising throughout Scotland in the local Press.

It was reported that a resolution from the Central District Committee had been passed to the Scottish Gas Board for consideration. This resolution recommended to the Board that a notice be put on all meters indicating the various practices to be avoided, such as turning the meter cock half open and putting money in the meter before all taps at appliances were turned off; that such notices advised consumers of the existence of the Rutten valve and its purpose; that local authorities also be informed that the Rutten valve was available.

In discussion, Mrs. K. Cook, Edinburgh, told the Council that she feit that no gas meter should be put out without competent instructions as to their use. These instructions should be placed in a spot easily accessible to housewives. At the moment many meters were put in cupboards and other such places that were not easily reached, and there were still many people who did not know much about gas.

Mr. Morrison said that they must wait to hear what the Board proposed to do. In much of the older property it was difficult to find even a place to put a gas meter, but the Board would reconsider this proposal in due course.

A member later reminded the Chairman of a statement that had appeared in the Press about the Gas Board bringing in a firm of consultants with a view to effecting more efficiency and economy, and which had given some hint to the public that there might be a reduction in the price of gas to the consumer. Was there any more information available?

Mr. Morrison said that there was none. It was true that certain schemes had been carried out which had had amazingly good results, but he thought there were some newspapers which printed articles which perhaps were not strictly in accordance with the facts.

The Directors of Radiation Ltd. have decided to pay an interim dividend in respect of the year ending December 31, 1953, on the ordinary stock at the rate of 3½% actual, less tax, and to pay the half-yearly dividend on preference stock. The interim is the same as for the same period last year, when the total for the year was 10%.

PUBLISHERS' NOTICE

The " Gas Journal " is published every Wednesday, price 1/3d.; by post 1/5d.

Subscription Rates: Home and Empire:—52/- per annum; Foreign:—60/- per annum. (Both payable in advance.) A copy of the " Gas Journal " Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at 1/9 per line (approx. 7 words)—minimum charge 10/6. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10" deep × 7" wide; block screen 120.

BUSINESS MANAGER : S. T. CULLEN

MIDLANDS OFFICE: 10, Union Street, Birmingham.

NORTHERN MANAGER: W. Q. Foster, 33, St. Helens Road, Harrogate. 'Phone: Harrogate 84291.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: CENtral 2236-7. *Telegrams:* Gasking, Fleet, London.

OXIDE

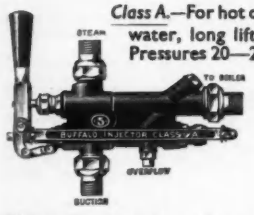
DUTCH AND DANISH BOG ORE
SPECIALLY ACTIVATED OXIDE OF IRON

Oxide supplied on loan or sale outright.
Highest prices paid for Spent Oxide.

Send your enquiries to

GAS PURIFICATION & CHEMICAL COMPANY LIMITED
ESTABLISHED 1873
PALMERSTON HOUSE, OLD BROAD STREET, LONDON, E.C.2.
Telegrams: "Purification, Stock, London." Telephone: London Wall 5077

BUFFALO INJECTOR



Class A.—For hot or cold water, long lifts, etc. Pressures 20—200lbs.

Please send for Catalogue

GREEN & BOULDING, LTD.
162a Dalston Lane, London, E.8

The
LIMIT OF EFFICIENCY CAN BE REACHED
by the use of
LUX
GAS PURIFYING MATERIAL

Sole Importers:
HARRISONS (London) LIMITED
66, Mark Lane, LONDON, E.C.3
Telegrams: Birchrock, London Telephone: ROYal 3128

"KLEENOFF" *
THE COOKER CLEANER

"KLEENOFF"
FIBRE BRUSHES
RUBBER MOPS

"KAY-DEE" *
KETTLE DESCALER

For resale to the public, and in bulk for Works use.

BALE & CHURCH, LTD.
7, CROMPTON WAY, CRAWLEY, SUSSEX.

FIRE!
MY LIFE LOST BUT FOR
NU-SWIFT!

"A match struck...an explosion... petrol-sprayed I became a living torch... but my 13-year old Nu-Swift Extinguisher saved me from agonizing death." Everyone has too many fire risks. What would you have done?

NU-SWIFT LTD. • ELLAND • YORKS
In Every Ship of the Royal Navy

PRESSURE VESSELS
FOR THE GAS AND CHEMICAL INDUSTRIES
Welding in all Metals (Gas or Electric)
Welding Repairs

RICHMOND WELDING CO.
Richmond Road, BRADFORD
Tel. : BRADFORD 25405

MISCELLANEOUS

FACTS ON THE PLATE

THESE DAYS, a sound investment is something to write home about. What we write of here is not a new discovery, for it has long been at the disposal of industry. The point is that only the alert are using it to their full advantage. We refer to the help afforded to administration by a FULL PHOTOGRAPHIC RECORD of constructional jobs from foundation to completed building, from rough casting to finished product. Nothing escapes the eye of the camera. No other recorder covers such a wide field. A progressive file of photographs taken at regular, specified intervals, is an ever-present aid to the busy executive. It can be referred to at once in case of any point which may arise during the construction of plant or the making of a product. It shows progress at a glance unmistakably and eliminates the cause of wrangling and argument.

Walter King Photographs are specially staffed and equipped for this type of work and are prepared to tour the Midlands, Southern Counties, and Home Counties.

Details of this photographic service on request to Walter King, Ltd., 11, Bolt Court, Fleet Street, London, E.C.4.

JOURNALS WANTED

THE following copies of the *Gas Journal* are required to complete volumes and, as the issues are now out of print, the Publishers would be pleased to purchase copies back from any subscriber having no further need of them.

1945	1946	1949
January 10	March 20	January 12
February 7	April 3	
June 20	May 1	

Walter King, Ltd., *Gas Journal* Offices, 11, Bolt Court, Fleet Street, London, E.C.4.

PLANT FOR SALE

POWER STATION EQUIPMENT

ONE—500 h.p. " Premier " Horizontal 4-cylinder Gas Engine No. 1802 running at 200 r.p.m. direct coupled to 1934 Lancs Dynamo 300 kW continuous rated 50 cycles alternator No. 105056 and exciter having rated output of 440/460 volts, 492/470 amps. 3-phase, 8 p.f. at 200 r.p.m.; together with steel switch control cubicle comprising oil immersed circuit breaker, alternator and exciter shunt control rheostats, volt and ammeters, power factor meter, etc., field discharge switch. Also oil immersed Bl. 180 kVA Power Factor correction condenser together with switch control panel.

ONE—270 h.p. " Premier " Horizontal 3-cylinder Gas Engine No. 1813 direct coupled to B.T.H. D.C. Shunt interpole Generator having a rated output of 1480 amp. at 220 volts when running at 190 r.p.m. complete with slate switchboard panel having mounted thereon volt and ammeter, Circuit breaker and Knife switch ; Shunt regulator. Ancillary equipment consisting of:— 3 Motor driven centrifugal water circulating pumps, water cooling tower, motor driven engine starting compressor and receivers. K.W. hr. meter and Reverse current relay.

The above engines are fitted with gas control change-over valves to facilitate use on producer or Towns Gas Supply.

ONE—" National " Horizontal Single-cylinder Gas Engine No. 30873 direct coupled to B.T.H. Shunt wound D.C. Generator having an output of 500 amps. at 220 volts when running at speed of 160 r.p.m.; complete with slate switchboard panel having mounted thereon volt and ammeter circuit breaker knife switch; Shunt regulator; K.W. hr. meter and reverse current relay ; Spare ammeter and spare field coils available. All in good working order. Address: No. 168, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

PLANT OPERATORS. Seniors and Juniors required, experienced in starting to work and servicing of Gasworks Carbonising Plants, Horizontals, Intermittent Vertical Chambers, etc. Good opportunities for experienced men. Pension scheme, profit-sharing, and opportunity for travel both in this country and abroad. Good salaries to the right men. Apply giving full details of previous experience, age and salary expected, to W. J. Jenkins & Co., Ltd., Beehive Works, Retford, Notts.

FLAVELS of Leamington have a vacancy in their laboratory for a PHYSICIST or PHYSICAL CHEMIST for development work on gas and solid fuel appliances. Applicants should preferably have a B.Sc. degree, or its equivalent, and some experience of industrial research.

Apply in writing to the Secretary, Sidney Flavel & Co. Ltd., Eagle Foundry, Leamington Spa, giving full particulars of qualifications and stating salary required.

SOUTH EASTERN GAS BOARD

DIVISIONAL HOME SERVICE ORGANISER
KENT SUBURBAN DIVISION
(OPERATING FROM LOWER SYDENHAM, S.E.26)

CANDIDATES must not hold a recognised diploma in cookery, laundry and housewifery and must have had not less than 3 years' experience within the Gas Industry in the organisation of demonstrations, lectures and home service calls. The successful applicant would be required to organise the work of Home Service throughout the Division in addition to normal Home Service duties.

Salary within Grade IX (Met. Area) Female—£516-£596 per annum.

Applications in writing, quoting reference V10/343 and giving full details should reach the undersigned not later than fourteen days after the publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

SENIOR REPRESENTATIVE, age 30/45, required by Ascot Gas Water Heaters Ltd., for the area of West Midlands Gas Board. Knowledge of gas industry essential and preference will be given to applicants with established connections. Must be able to drive. Car provided. Good remuneration (pensionable) and prospects. Applications, in strictest confidence, to the Sales Manager, 255, North Circular Road, Neasden, N.W.10.

DRAUGHTSMAN (SENIOR) age 30/40, for large constructional engineering Co., in the Midlands. Wide gas-holder and platework experience essential. Good opening for right man. Pension scheme. Write in confidence stating age, experience, and qualifications and salary expected to: Director & Secretary, Box No. 256, 19/21 Corporation Street, Birmingham, 2.

NORTHERN GAS BOARD

WESTERN GROUP
TECHNICAL ASSISTANT—
CARLISLE DIVISION

APPLICATIONS are invited for the above appointment.

Applicants should be experienced in the operation and maintenance of continuous vertical retorts with modern ancillary plant.

The salary will be in accordance with Grade A.P.T. VI of the National Salary Scales (£490-£570 per annum).

The successful applicant will be required to pass a medical examination and be subject to the provisions of the Board's Staff Pension Scheme.

Applications stating age, training, qualifications and experience should be addressed to the Divisional General Manager, Gas Works, Rome Street, Carlisle, not later than October 10, 1953.

A. R. CROFT,
Group General Manager.

NORTHERN GAS BOARD

WESTERN GROUP
ASSISTANT GROUP SALES MANAGER

APPLICATIONS are invited from suitably qualified persons for the above appointment.

Candidates must have a wide experience in all aspects of showroom and district sales work and of consumer service generally.

The salary will be within the Grade A.P.T. VII of the National Salary Scales £545-£625 per annum and the successful candidate will be required to pass a medical examination and be subject to the provisions of the Board's Staff Pension Scheme.

Applications stating age, training, qualifications and experience, together with the names of two referees, should reach the undersigned on or before October 31, 1953.

A. R. CROFT,
Group General Manager.

50, Castle Street,
Carlisle.
October, 1953

SCOTTISH GAS BOARD

EDINBURGH DISTRICT
GASFITTING SUPERINTENDENT

APPLICATIONS are invited for the above appointment. Candidates should have considerable experience in training and control of gasfitters and in the supervision of large scale gasfitting installation work.

Applicants must possess the Higher Grade Certificate of the Institution of Gas Engineers in Gas Engineering (Supply) or equivalent qualification.

The salary for the appointment will be within Grade XII (£740-£865 per annum) of the National Salary Scales for Gas Staffs. The post is superannuable and the successful candidate will require to pass a medical examination.

Applications stating age, education, training, qualifications, and experience, together with the names of two referees should be sent to the undersigned within fourteen days of the publication of this advertisement.

DAVID BEAVIS,
Divisional Controller.

15, Calton Hill,
Edinburgh, 1.

WALES GAS BOARD

LLANELLY AND GOWERTON
UNDERTAKINGS

APPLICATIONS are invited for the position of ENGINEER AND MANAGER of the Llanelly and Gowerton Undertakings.

Candidates for the appointment, which will carry a salary of £1,200 per annum, must have had wide administrative experience and possess appropriate technical qualifications.

Applications, stating age, qualifications and experience together with details of present and previous appointments and names of two referees, should be received by the undersigned not later than October 27, 1953.

C. B. MAWER,
Secretary to the Board.

2, Windsor Place,
Cardiff.

WEST MIDLANDS GAS BOARD

SENIOR PHYSICIST—
AREA LABORATORIES

APPLICATIONS are invited for the above post, which is located in Birmingham.

Candidates should possess an Honours Degree or equivalent, and have had at least five years experience in the gas or chemical industries.

The duties include physical determinations and investigations and the supervision of such work. Experience of Industrial Instrumentation and Gas Calorimetry will be an advantage.

The salary will be within the range £900-£1,125 per annum.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with the names of two referees, should be addressed to the Industrial Relations Officer, West Midlands Gas Board, 6, Augustus Road, Edgbaston, Birmingham, 15, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

SOUTH WESTERN GAS BOARD

MECHANISATION OFFICER

APPLICATIONS are invited for the post of Mechanisation Officer tenable in the Chief Accountants Department at the Board's Head Office in Bath.

The post is a responsible one, requiring ability to design, implement and control a large scale centralised punched card system.

Applications will be entertained only from persons of proven ability in this type of work and possessing wide technical experience of punched card machines with a knowledge of modern developments including electronics.

The commencing salary will be not less than £1,000 per annum according to ability and experience.

The successful applicant will be required to pass a medical examination and to join the Board's Staff Pension Scheme unless he is otherwise ineligible in accordance with the Rules of the Scheme.

Applications, giving age, experience, present appointment and salary, together with the names of two referees, must be received by the undersigned not later than October 20, 1953.

W. N. CURTIS,
Secretary and Solicitor.

9*a*, Quiet Street,
Bath.

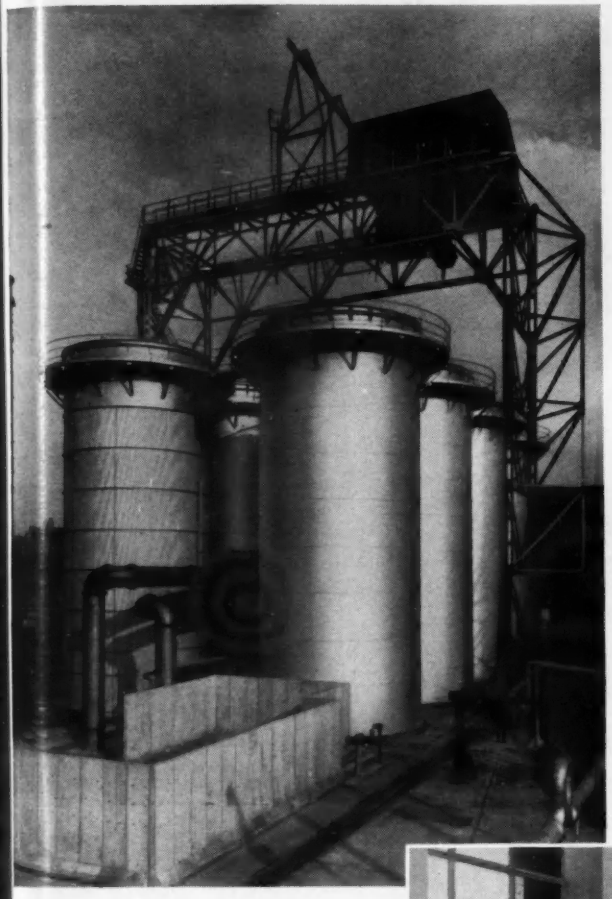
SCRAP GAS METERS WANTED

Top prices paid—Collection arranged from anywhere in U.K.

Sell to those best suited to deal with them.

Sell to — MITCHAM SMELTERS LIMITED
Rometal Works, Red House Road,
Mitcham Road . . . CROYDON . . . Surrey.
Tel: THOrnton Heath 6101. (Private Branch Exchange).

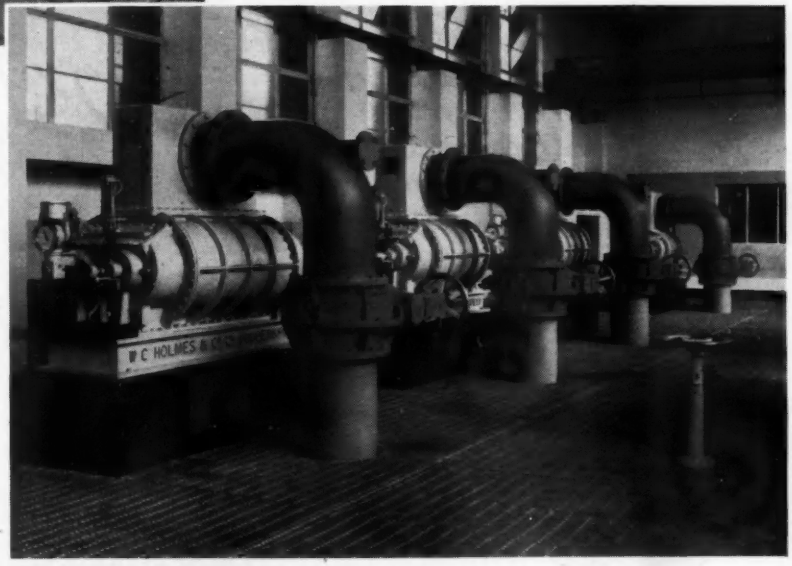
Truck Loads to our own private siding, Beddington Lane, Southern Region.



Holmes installations at Swan Village Gas Works

Installation of Holmes Tower Purifiers—Capacity 11 million cu. ft. daily.

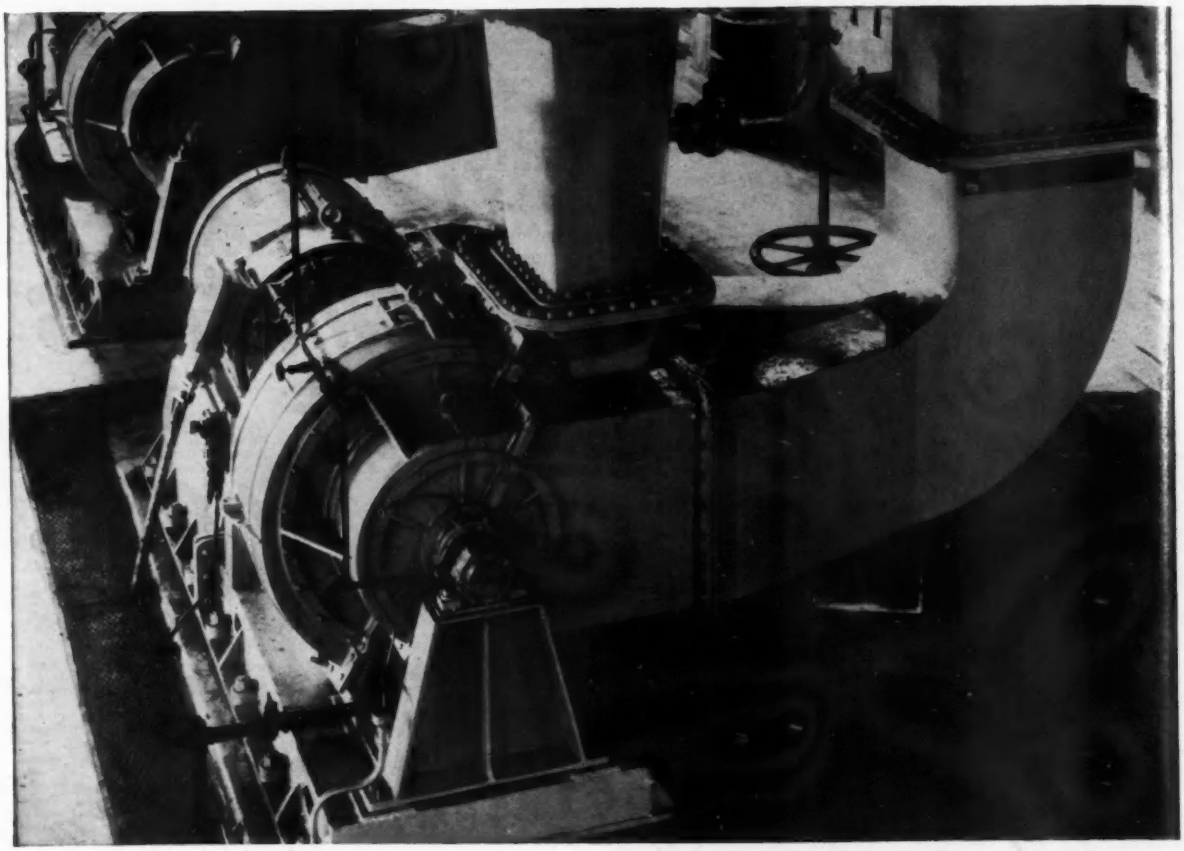
Also assembly of Holmes-Connersville Meters for Coal Gas and Water Gas.



By kind permission of the West Midlands Gas Board

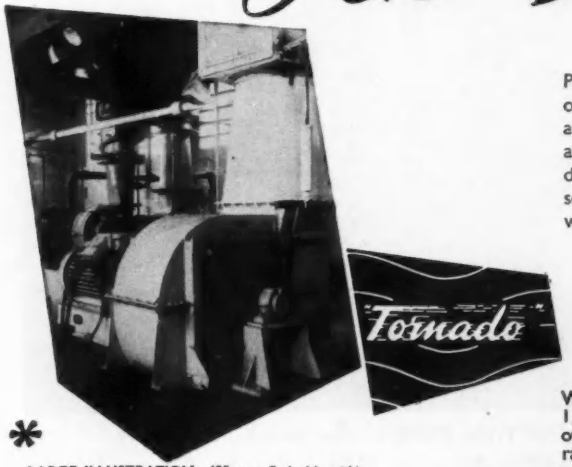
FOUNDED 1850 HOLMES HUDDERSFIELD

W. C. HOLMES & CO. LTD · TURNBRIDGE · HUDDERSFIELD



Illustrations by courtesy of the South Eastern Gas Board and Messrs. Humphreys & Glasgow Ltd.

Gas Boosting *



Part of an installation at the East Greenwich Gas Works for the supply of South London's gas are the "TORNADO" gas boosters illustrated above. Each is capable of shifting over a million cubic feet of producer gas an hour, and each was supplied with cast iron gas tight casings with detachable segments for easy servicing, stainless steel impeller and shaft, self aligning roller bearings and flexible couplings. One of the boosters was arranged for motor drive and the other for steam turbine.

*

LARGE ILLUSTRATION: *42" type 9 double width double inlet gas boosters.*

DUTY: 1,095,000 cu. ft. per hour producer gas at 104°F. saturated, giving 28" w.g. differential over inlet and outlet connections taking 138 H.P.

SMALL ILLUSTRATION: *40" type 15 air blowers.*

DUTY:	*Closed outlet*	*Delivery*
Air quantity	*nil*	*12830 c.f.m.*
Speed r.p.m.	*1480*	*1475*
Static pressure	*15.8" w.g.*	*13" w.g.*
Power absorbed	*13 B.H.P.*	*39 B.H.P.*

FAN ENGINEERING AND INDUSTRIAL GAS EQUIPMENT

We are manufacturing gas boosters which cover a range of from 5,000 to 1,500,000 cubic feet per hour, and if you are concerned with the movement of air or gas, ask us to send you Publication No. 5/7, a survey of the standard range of "TORNADO" high pressure blowing and exhausting fans.

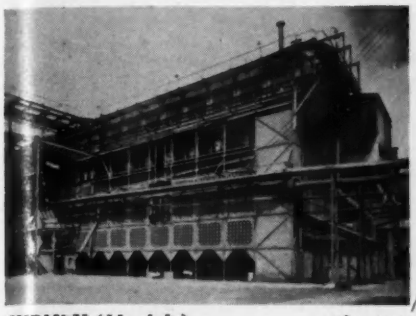
Keith Blackman LIMITED

MILL MEAD ROAD, TOTTENHAM, LONDON, N.17

'Phone: Tottenham 4522 (twelve lines). 'Grams: "Keithblac, Norphone, London."

434

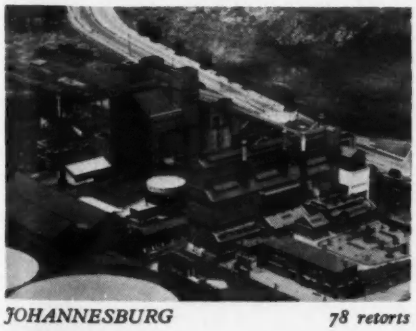
Registered as a Newspaper. Printed by STRAKER BROTHERS LTD., E.C.2 for WALTER KING LIMITED, 11, BOLT COURT, FLEET ST., LONDON, E.C.4. Wednesday, October 14, 1953.



SYDNEY (Mortlake) *496 retorts*

SOUTH BRISBANE *56 retorts*

WELLINGTON *96 retorts*



JOHANNESBURG *78 retorts*

TORONTO *104 retorts*

FLEXIBILITY IN THE COMMONWEALTH

Flexibility of control enables Glover-West continuous vertical carbonization plant to deal efficiently with any gas-making coal. This fact—and the resultant fuel economy—recommends the system to expanding gas industries in the Commonwealth and elsewhere. Backed by progressive research producing such developments as "Balanced Heating", the "Hot Gas" Mechanical Producer and the Sector Discharger, it keeps the name of Glover-West in the forefront of gas-making practice. In carbonization, at home and overseas, flexibility counts.

West's Gas IMPROVEMENT CO. LTD.

ALBION IRONWORKS · MILES PLATTING · MANCHESTER 10

Telephone: COLlyhurst 2961 *Telegrams: Stoker, Manchester*

London: Columbia House, Aldwych, W.C.2. Phone: HOLborn 4108-9
Grams: Wesgasco, Estrand

GW 2a

"BROOMWADE"
Equipment
gets things done

"BROOMWADE" Compressed Air Equipment performs many construction and maintenance duties for the Gas industry — riveting gas holders, mains excavation, paint spraying, breaking up spent oxide—all these functions and more can be tackled with safety, efficiency and dependability.

"BROOMWADE" Pneumatic Equipment is built to meet your requirements.

"BROOMWADE" offers you:

- *Expert technical advice on all your compressed air problems.*
- *Complete world-wide after sales service.*
- *Early delivery.*

Write to "BROOMWADE" to-day.

RELIABILITY

"BROOMWADE"

BROOM & WADE LTD., HIGH WYCOMBE, ENGLAND. Telephone: High Wycombe 1630 (8 lines) Telegrams: "Broom", High Wycombe.
26 SAS